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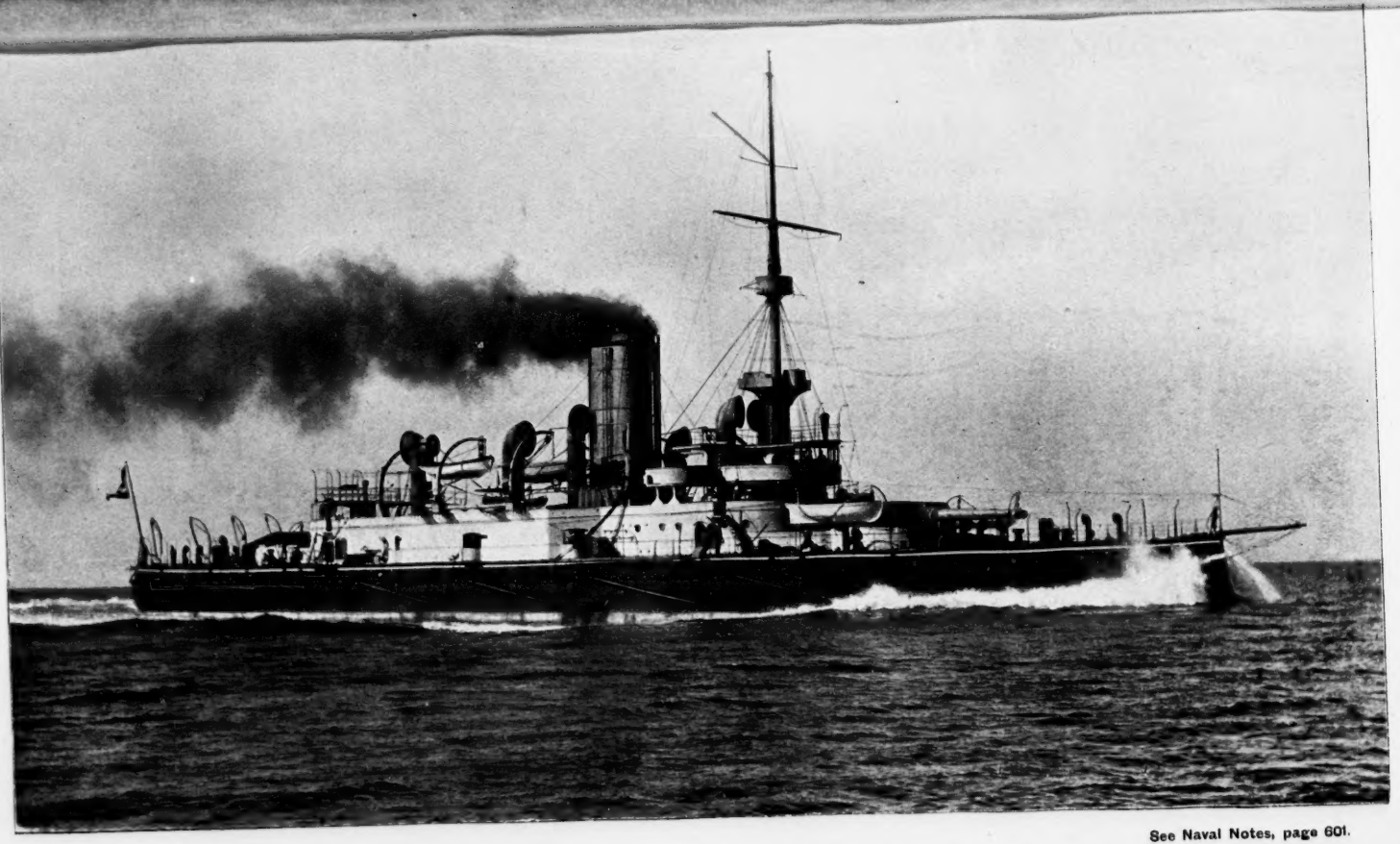

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THE NEW AUSTRO-HUNGARIAN BATTLE-SHIP **"BUDA-PEST,"** 5,550 TONS, 6,000 I.H.P.

ERRATUM IN PRINTED LIST OF LECTURES, AFTER EASTER, 1898.

For "June 10th, Friday," read "June 6th, Monday," as Date of Lecture by Major Sir R. Colleton, Bart., on "Training of a Battalion in the Attack."

EXTRA LECTURES.

Friday, 20th May, at 3 p.m.

"On the Working of the Röntgen Rays in Warfare, as the Result of the Experience gained during the recent Operations on the N.W. Frontier, with Magic Lantern Representations of Cases of Interest from the Campaign." By Surgeon-Major W. C. Beevor, M.B. Surgeon-Major-General J. Jameson, M.D., C.B., Q.H.S. Director-General Army Medical Department, in the Chair.

Thursday, 30th June, at 3 p.m.

"Manœuvres in France, 1897; Two Cavalry Divisions and an Army Corps. Remarks addressed to Infantry and Cavalry Officers by General de Négrier." By Major-General the Hon. R. Talbot, Commanding Cavalry Brigade at Aldershot. General H.R.H. the Duke of Connaught, K.G., Etc., Commanding the Aldershot Division, in the Chair.

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VOL. XLII. MAY, 1898. No. 243.

[*Authors alone are responsible for the contents of their respective Papers.*]

SECOND PRIZE ESSAY.

Subject:—

THE PROTECTION OF COMMERCE DURING WAR.

By Captain C. F. WINTER, Canadian Militia, Adjutant, Governor-General of Canada's Foot Guards.

"Paremur."

"He who commands the sea controls trade and commerce; he who controls trade and commerce commands the wealth and riches of the world; and he who controls wealth controls the world."

THESE words of Sir Walter Raleigh, one of our most celebrated British soldier-discoverers and colonisers, may very aptly be taken as a text for an essay upon a subject of such momentous importance to the British peoples as is that of the protection of commerce during a time of hostile operations and conflict. For if Sir Walter's practical experience at the very birth, if one may so term it, of our Imperial greatness, taught him the value of sea-power, the experiences of the intervening three hundred years, with their rich stories of heroic effort, hardy perseverance, disasters successfully retrieved, and adventures gloriously concluded, ought fully to suffice to impress upon his countrymen of the present the concrete wisdom of his statements.

From the very small beginnings the trade and commerce of England and the British Isles have grown steadily to the gigantic proportions of that of the Empire of the present day; the amount carried annually over sea alone is computed to be of the value of over £1,100,460,000, or if the estimated value of the shipping of the British Empire be added (10,512,272 tons at an average value of £12 10s.) £1,231,713,400, and it is rising steadily. To the ordinary mind these figures convey little or no impression—one is unable to grasp without serious reflection the actual meaning of such an array of counters; but when one considers that the total valuation of property in England subject to local taxation is returned as under £160,000,000, whereas the value of British seaborne trade and shipping is fully eight times as great, one begins to realise the enormous interests of our people yearly entrusted to the wide expanses of the oceans.

But this phenomenal growth of trade and commerce, adding constantly to the material well-being and comfort of our people, as it has, has also, by that very fact, imposed upon us a responsibility, vast and all-important to the future of our race. By the increase in our carrying trade, and the keen competition among shippers, the cost of necessities and commodities of all kinds has been cheapened to the masses of the people, and this, through the kindred agency of free and open ports, has now become such an established feature in Imperial economics that any interruption in, or interference with, the unhampered flow of the Empire's commerce, would be followed, more or less, by sufferings and privations on the part of some great section of the British peoples. To keep open the routes of commerce and to provide means for removing even the fear of disastrous consequences to our shipping, and the consequent abnormal rise in the prices of food products, is the great task entrusted to the Royal Navy, with its auxiliary fleets of chosen merchant-cruisers, etc. Napoleon said "An army moves upon its belly," and it is conceded by the best of experts that this is true, for without an adequate and regular supply of food the best of Armies soon become useless. If true with an Army, how much more pertinent is it when applied to a nation, unable of itself, under present-day conditions, to feed its vast multitude of mouths from month to month, if its over-sea supplies are cut off or withheld! To a nation facing such an alternative, the defence of its trade routes and the protection of its commerce must always be of the most vital importance. To the United Kingdom commerce has become indispensable; and, if absolutely necessary to the comfort and welfare of her people, it is equally indispensable that it continue in the established routes with its accustomed regularity, its wonted short cuts, and increasing frequency. Britain in her present circumstances may be likened, comparatively, to a huge factory situated in the centre of a prairie or desert plain of immense extent, across whose trackless wastes most of the raw material for use in the establishment in the first instance, all the exported product, and much of the food for the workmen engaged in its manufacture, have to be conveyed. Jealous rivals live on the confines of this prairie, and in case of rupture of peaceful relations with one or any of them, the question of how to maintain the necessary shipments of supplies of all kinds over such long lines of communication, and keep its conveyance from being transferred from the factories' own vehicles to those managed by outsiders, becomes all-absorbing and important. Another example—in a much smaller way, of course—may be cited as presenting conditions similar to those under which British trade would have to thrive during war—it is that of the early immigrants crossing the American prairies before the days of railways. Hostile Indians on all sides made their routes insecure and dangerous, the prairie "schooners" were often wrecked and captured, the difficulties met with threatened extinction to trade and travel, but the spirit of expansion and the land-hunger of our English-speaking race made itself felt, and moved the Government to plant military posts and establish garrisons to ensure the safety of what was so dear to the people as a whole. The similitude is

not unstriking—the prairie was the sea, the immigrant trains the ships of commerce, the military posts and garrisons, telegraph lines, etc., the war-ships, coaling and refitting stations, cable lines, etc., which are the necessary adjuncts of that situation if the policing of the seas is to be as successful in the event of war, as were the measures taken upon the prairies of the West for the safety of the trade and travel routes not many decades since.

At the present time it must be most gratifying to Britishers that at last the Empire, as a unit seems fully alive to the importance of this great subject; and, in addition to Naval Defence Acts, vast credits for building ships and increases in officers and men on the part of the home Government, a recent spontaneous offer by Cape Colony to contribute a battle-ship to the Royal Navy may not improperly be accepted as an evidence of a similar feeling and intention on the part of "Greater Britain" beyond the seas. The subject, however, is so wide and the interests involved so momentous, as also our territories so dispersed and scattered over the whole globe's surface, that the protection of trade in the event of hostile menace is a task which may well engage the attention and best effort of the whole, because the very excess of territory which in peace is our pride may easily become in war an embarrassment and discomfiture. No true Briton will, however, complain of the great responsibilities thus laid upon his shoulders by the progressive and expansive spirit of his fathers, but will rather set to work resolutely to devise ways and means to protect those freights upon the seas (the envy of his neighbours) in the event of any and all complications that may come to threaten their safe conduct. "What we have we'll hold" is indeed the concrete kernel of the sentiment that animates our people with regard to their Colonial Empire, and the same may be applied with equal truth to our wealth of trade and commerce throughout the world. The necessity, however, for active and constant preparation is acute when we know from published plans of the Admiralties of foreign countries that in the event of war against Britain "commerce destroying" is to be prosecuted with the utmost vigour. French naval writers and public men have candidly stated their intentions of pursuing this policy in the event of war, and, in the United States, the doings of the "Alabama" and "Shenandoah" in the late civil conflict between the States are constantly utilised to show the popular course that would be followed should hostilities at any time break out between the Republic and the mother country. "Fore-warned is, however, fore-armed"; and knowing, as we do, the most likely tactics of our enemies in case of war, there seems no reason why we should not prepare to counteract these efforts in every possible particular.

The protection of "commerce," while directly applying to the protection of trade and the uninterrupted exchange of commodities between home citizens and those of distant lands, in war-time naturally associates with it the "carrying trade," or, in other words, the ships and vessels engaged in effecting the exchange itself. Thus the protection of commerce during war implies not only the safe-guarding of the cargoes, so indispensable to the complex society of our day, but, even more so,

the marine vehicles of their transport across the seas, and the prevention of their transfer, either forcibly by an enemy, or from a feeling of inadequate security on the part of the owners, to a flag other than that to which they rightfully belong. Experience has shown in the most marked manner the very natural timidity of proprietors of shipping during war-times, and the speed with which capital invested in a nation's marine carriers hastens when that nation does not provide (or cannot do so) what they consider adequate security for its safety, to transfer itself to the flag of a neutral, under which the temporary dangers feared are hoped to be avoided. This was exemplified in a most striking manner during the American Civil War, 1861-65. In 1861, at the beginning of the conflict, the shipping of the United States aggregated 5,539,813 tons. At sea the Federal Government was weak, the Navy being but a nominal one, and quite unable to prevent the depredations upon Northern shipping by Confederate cruisers which followed the outbreak of hostilities. The success of the "Florida," "Shenandoah," and the famous "Alabama" (Lairds' No. 290) created a perfect panic among the shipowners of the North, and hasty transfers of a very large proportion of the deep-sea shipping of the United States were made to neutrals—mostly to British subjects, as may be gathered from a perusal of the following figures for that period:—

In 1861 the commercial shipping of the United States aggregated	5,539,813	tons.
In 1866 it had fallen, through the war, to ..	4,310,778	,,
A loss of	1,229,035	,,
In 1861 the shipping of the United Kingdom (exclusive of the Colonies) aggregated ..	4,359,695	tons.
In 1866 it had grown (by building and transfers from other countries) to	5,452,862	,,
A gain of	1,093,167	,,

A large proportion of this gain was shipping transferred from United States registry to that of Great Britain.

The disastrous effects of the war upon Northern shipping is even more vividly shown by a perusal of the imports and exports at the great port of New York during that period. In 1860 the total value of imports and exports at New York, aggregated as follows:—Carried in United States vessels, $233,893,593; carried in foreign vessels, $149,923,149. At that time nearly double the value was carried by the home trade, but during the war the proportion steadily shifted, until in 1864, towards the close of the conflict, the value of commodities carried in United States vessels was but $74,016,600, while that carried in foreign ships had risen to $405,390,883, or nearly six times that carried by native shipping. The editor of the "Statesmen's Year Book" for 1867, says:—"A glance at the above table will show "that whereas in 1860 the greater part of both the import and export trade of New York was carried by American vessels,

the latter had less than one-fifth of the trade in 1864. The transfer was mainly in favour of the shipping of the United Kingdom."

The great dangers to be apprehended to a nation's commerce during a period of war may be generally summarised as follows:—

1. The destruction or capture of ships and cargoes by hostile cruisers.
2. The interruption and confusion of trade, with the consequent rise in food products and necessities, to be followed naturally by great sufferings on the part of the majority of the population.
3. The loss of a nation's ocean-carriers by owners transferring them to a neutral flag, and the discouragement of ship-building.
4. The deflection of established trades to neutral ports with every likelihood of their permanent loss.
5. The paralysis of credit.

Before, however, proceeding to show how best, (in the humble opinion of the writer) these dangers can be avoided and guarded against, it would be well to look into the records of the past and see how our trade and commerce has fared during past wars.

Historical Résumé.

In the study of the majority of human problems the lessons of history are profuse and *à propos;* similar conditions and experiences very generally offer themselves as guides whereby a rule of conduct can be mapped out and followed, and where the attendant contingencies can to a greater or less extent be foreseen and provided for. But as regards the great problem made the subject of this essay, the history of our land, owing to the marvellous and rapid advances in the arts and sciences, and the wonderful changes lately brought about in all that pertains to the vessels themselves, as well as "they who go down to the sea in ships," can offer us but little guide, speaking in a general way, of how to properly and successfully defend a shipping which in the aggregate of its tonnage is more than one-half of that of all the nations in the world combined. The great sea wars, when last our commerce was in danger, were conducted under such vastly different conditions that one might say there was but little to learn and profit from in their perusal; but, after all, though details have altered wonderfully, the main great principles of protection are the same. Fast cruisers, flitting about capturing and destroying merchantmen, must still be brought to book by yet fleeter cruisers. Battle-ships blockading great ports must still be met and dispersed by more powerful and better-handled battle-ships. In brief, the answer would still seem to be: to properly protect an immense commerce an omnipresent and overwhelmingly powerful fleet is indispensable. Opinions will, it may readily be surmised, always differ as to what constitutes an *adequate* fleet; but with the performances of cruisers and privateers in the past before our eyes, as well as the known capabilities of steam, it seems but wise and right to adopt the highest possible standard of numbers and efficiency irrespective as to whether

our expected hostile opponent is, nautically speaking, a strong or a weak State. Prepare always for the worst; let that be the standard; and not what might suffice for the best, or even half best.

Early maritime wars present for our consideration little, if any, indication of an attempt at organised effort (as we now understand it) for the special protection of trade. Commerce was but then comparatively in its infancy, and the course of trade was intermittent and uncertain. The greatest danger to be guarded against, and one always present both in peace and war, was capture by pirates and freebooters—lawless men, owning allegiance to no country particularly—whose hand was against every man's, and who lived upon the spoils of captures whenever and wherever found. In early times the venturesome merchant tried to ensure the safety of ship and cargo by fast sailing and a strong and well-armed crew; then, as these marauding attacks became more serious, several merchants would club together and employ an armed vessel manned by soldiers or mercenaries to act as escort, and thus the convoy system was inaugurated.

In Britain and "Greater" Britain, accustomed as we are at the present day to look upon the Navy as the natural corollary to the growth of our trade and commerce, and to consider the protection of the latter its main functions, still it must not be forgotten that this is not its only duty, and was not in the beginning the prime reason for its creation and existence.

The reign of the Illustrious Alfred is usually quoted as the period which gave birth to our British Royal Navy, and certainly it was not the protection of their trade that moved our fathers in that age to organise a regular armed service for the sea. Rather was it for the defence of their coasts and the prevention of those raids by marauding Danes and Northmen which for so long caused such loss and suffering upon the south and east coast counties of England. As a defence against invasion, and later as a means to enforce respect for national rights and obligations, the Royal Navy has continued its steady growth to its present fine proportions, though it is only of late years comparatively that its high mission and great importance to the nation as a whole has been understood and appreciated. In former times, in times of trouble and imminent danger, the Navy grew and increased suddenly, to languish and decline once peace was declared, until another storm upon the seas of diplomacy awakened the "powers that were" to a sense of its great necessity. The wisdom of the saying "In times of peace prepare for war" was not then so generally accepted, nor were the conditions of warfare, either by sea or land, such as to necessitate the preparation in peace-time which is now imperative.

The study of our past history does not, however, show that great loss and destruction (relatively) of our shipping and commerce which foreign writers so glibly assure us will be the condition of things in our next great war with a first-rate Power. On the contrary, it is a curious fact that at the very time when it appeared as though our people were struggling for their very existence, and countless seizures were being

made of their shipping, the balance of advantage after all generally always rested with us, and though our losses through captures by the national vessels of the enemy and his privateers were very great, the proportion of such loss, and its effect upon the whole trade and commerce of the kingdom, was as nothing compared to the corresponding loss inflicted upon our opponents by captures made at the same time by our own seamen.

During the Seven Years' War, between the years 1756-1760, 2,500 British merchant-ships were captured or destroyed, and in 1761 800, out of an estimated total of close upon 8,000, British merchant-ships, or 10 per cent., were captured by cruisers or privateers of the enemy. Campell, in his "Lives of the Admirals," says:—"The trade of England increased gradually every year, and such a scene of national prosperity while waging a long, costly, and bloody war, was never before shown by any people in the world."

In commenting on the results of the war in 1778, Captain Mahan, U.S.N., says:—"Especially is commerce-destroying misleading when the nation against whom it is to be directed possesses, as did Great Britain, *and does*, the two requisites of a strong sea-power—a widespread healthy commerce and a powerful Navy. Only by military command of the sea by prolonged control of the strategic centres of commerce can such an attack be fatal. Such control can only be wrung from a powerful Navy by fighting it and overcoming it"

Between 1793 and 1815, that long struggle from which our country emerged victorious, and during which, after the battle of the 1st of June, the whole energies of the French Republic and her Continental allies were directed to the subjugation of Britain through the destruction of her commerce, the total number of British merchant-vessels captured (1793-1814) amounted to 11,000, but the number of ships belonging to Great Britain rose from 16,875 in 1795 to 23,703 in 1810. Captain Mahan, U.S.N., estimates that during this period the direct loss to the nation through these captures did not amount to more than $2\frac{1}{2}$ per cent. of her commerce, and that this loss was appreciably made good by the prizes and merchandise taken by our own ships of war and privateers. On the other hand, the result of the war was fatal to the commerce of our great opponent. Before the war Admiral de la Reveillère asserts that the foreign commerce of France equalled that of England. In 1799 the French Directory admitted "that not a single merchant-ship is on the sea carrying the French flag."

The lessons of comparatively recent history, therefore, show that in times of previous stress when possessed of the two great attributes requisite to successfully resist a war upon commerce—viz., a "healthy trade and an all-powerful Navy," our people were able to experience a net result in their favour. The question then naturally arises, Are the conditions of the present such as to warrant us in the presumption that a similar result would follow were we unfortunately to become involved in war with a great Power, or combination of Powers, at the present time?

Our trade over the sea is as great, in fact much greater, relatively to that of other countries than it was at the time of the Great War. As represented by our merchant shipping it shows an overwhelming preponderance. The aggregate tonnage of the British Empire amounts to 10,512,270 tons, while that of all other nations combined (all under 100 tons omitted) is given as only 8,449,000 tons. And in the value of the trade carried by this shipping annually the same disparity exists. We would therefore appear to be possessed of the first great requisite beyond any question, and it is a commonplace to admit that the British "Royal Navy" is the strongest and finest marine force in the world; yet the question still lies—Is it, in proportion to our great commercial shipping and its diversity over the whole world, strong enough to afford that protection to our trade everywhere that will undoubtedly be expected by our people in the event of war? The very magnitude of our shipping is in itself a weakness, since it offers a correspondingly large number of opportunities for an enemy's attack. Taking the steamships of the world alone, in 1896 no less than 6,377,000 tons were of British registry, while only 3,624,000 tons were under all foreign flags, or, if we include the steamers plying on the inland lakes and waters of the United States (very many of them of sea-going size and capacity), the total foreign steamship tonnage is brought up to 5,332,000 tons. Including, however, only ocean-going ships (steamers) the British Empire possesses at the present time nearly two-thirds of the whole tonnage of the world. In the event of war these would undoubtedly be exposed to great loss, the extent of which must be governed by the strength and vigilance of the Royal Navy aided by such efforts as shipowners and the merchantmen themselves may be able to make, suggestions in connection with which will be offered later on in this essay. Of one thing, however, we may rest assured, and this must appear plain to the merest tyro in naval matters—viz., that if the Navy is not strong enough and the command of the seas lost, the ruin of British commerce is assured. To comprehend just what this would mean, one must remember that one hundred years ago the British Isles were nearly, if not quite, self-sustaining; to-day, they are not provisioned more than for a few months; then, an interrupted commerce was a luxury, a thing that might be done without complacently for long periods; now, it is an absolute necessity to the well-being and comfort of the majority of the population of the United Kingdom, and one requires no very great imagination to conceive the dire results that would follow its destruction, even though more or less of a temporary nature, as such might be. That the Navy of Britain is strong there can be no question, but its responsibilities and duties in time of disturbance are tremendous. Judged from the relative standards of other nations' Navies in proportion to their shipping and trade carried in their own vessels, the Royal Navy is numerically weak, as may be seen from the following computations:—

The sea-going merchant shipping of Russia (1893) is given as 492,202 tons.

Her Navy's tonnage amounts to 378,199, without the Volunteer Fleet,

The sea-going shipping of France, 1,129,575 tons.
Her Navy (exclusive of torpedo boats), about 600,000 tons.
The sea-going shipping of Germany, 1,943,751 tons.
Her Navy (exclusive of torpedo-boats), about 390,000 tons.
The sea-going shipping of Austria, 318,830 tons.
Her Navy (exclusive of torpedo-boats), 124,925 tons.
The sea-going shipping of the United States, 526,725 tons.
Her Navy, 260,115 tons.

While for the British Empire corresponding figures are as follows:—
Sea-going commercial shipping, 10,512,272 tons.
Royal Navy, built or building, but exclusive of 90 torpedo-boat destroyers and torpedo-boats, 1,386,945 tons.
(In figures of commercial shipping all vessels under 100 tons are omitted.)

The disparity in the figures of these various countries is striking. Thus the proportion of naval tonnage to that of the tonnage of all shipping (except vessels under 100 tons) of each country is as follows (approximately):—

Russia -	Commercial shipping (sea-going)	56	per cent.		Naval tonnage	44	per cent.	
France	,,	,,	65	,,	,,	,,	35	,,
Germany	,,	,,	83	,,	,,	,,	17	,,
Austria	,,	,,	71	,,	,,	,,	29	,,
United States	,,	,,	67	,,	,,	,,	33	,,
British Empire	,,	,,	88	,,	,,	,,	12	,,

At first sight these figures are apt to startle one. The fact that Russia and France combined possess about 38½ per cent. of their floating vessels of all descriptions in the form of vessels of war for the protection of the remaining 61½ per cent., while the whole British Empire has but 12 per cent. of its floating fabrics of such character, is conducive to apprehension as to whether we are yet numerically strong enough in proportion to our trade. There are, however, so many other features to be considered that one is not altogether right in jumping at such conclusion. The tonnage of our Navy is, on the whole, of much more recent and more modern construction than that of others, it is a much more practical organisation than the majority of foreign Navies, and enjoys an enviable world-wide prestige that would certainly weigh with most of our possible opponents. It is also supplemented by supply stations, docks, and coaling yards, in all parts of the world, such as are not possessed in any such degree by any other country, and can, if need be, be augmented by the cream of the merchant-ships retained for special service by the Admiralty. In this way so many factors enter into the argument that it is quite impossible to say from the mere figures quoted above that our Navy bears an undue proportion to that of our shipping wealth.

On the other hand, it would be quite idle to argue that because France and Russia possess 38½ per cent. of their floating tonnage, and the United States 33 per cent. of theirs, in naval power, these countries

would be much better able to protect their commercial shipping in the event of war than we British would with but 12 per cent. If at war with Britain there can be but little doubt that in a very short time all commercial shipping of these countries would disappear, our 12 per cent. giving us relatively so much greater power and scope than their larger ratios, so that in every probability the experiences of the last century on the sea (quoted on page 513 *ante*) would, so far as we are concerned, be repeated, and though our losses would of necessity be enormous, those of our opponents would be such, relatively, as to mean extinction to their marine trade carried by their own shipping.

But while it may be more or less cheering to us to know that, in the event of trouble, we can do more damage to possible opponents through their shipping than they can do to us; still, we must not forget how much more important the shipping interests are to our people and their comfort than to those of most foreign countries; so that in the mutual game of destruction, the fact that we can do more than our adversaries is small consolation to set-off against the war prices and scarcity that would be sure to follow any interruption, no matter how temporary, in our commercial intercourse with the Colonies and outside world. It is therefore to devise means, to conceive plans, to offer suggestions how best our mercantile marine, scattered all over the world, may be protected in the event of war, with the view of a thorough system being inculcated that our best efforts should be bent, for in no better work, bearing as it does upon all the best interests of our race, can any son of the Empire be engaged.

The Present Ocean Highways of British Commerce and their Normal Protection.

The commercial enterprise of our people, following fast upon the track of early pioneers, discoverers, and navigators, long since established ocean highways now well known and travelled with a frequency and regularity quite equal to any of the beaten tracks of trade and travel upon land.

First and foremost, however, in any consideration of these commercial highways must be those waters surrounding the heart of the Empire, towards which all the highways converge, and the safety and security of which must ever be the key to our supremacy of the seas. Chief among these important waters is the English Channel, the loss of the command of which would soon render the protection of the majority of the outlying routes of commerce abortive and useless. It is, however, taken for granted that the full importance of this section is thoroughly appreciated by everyone, and that the Admiralty will leave nothing undone to maintain its historic security. This can only be accomplished by retaining strong patrol squadrons in home waters with powerful fleets of battle-ships at important points in the United Kingdom capable of meeting and resisting any attack that might be made by an opponent's heavy ships upon our ports and arsenals, dockyards, etc. Of course the truth of Captain Mahan's findings is universally accepted (long ago reiterated by our

great Nelson in his despatches), viz., that the best way to protect your commerce is by scattering and breaking down the sea-strength of your enemy at the very beginning by attacking and destroying his fleets wherever found, and that it is taken for granted that such would be the course followed by Great Britain in the event of war. Still, notwithstanding this, a strong force must always be left in home waters to keep open and uninterrupted the "home stretch," as it were, of the great trade routes. For the special protection of trade during war, the Channel and Scilly Islands, from their geographical position, should be made use of as naval picquet stations, if one may so term them, where patrol-vessels of the fleet could coal and replenish, and news by wire be rapidly repeated throughout the off-shore squadrons as well as from them to headquarters. The routes to the Baltic and the near-by Dutch and Belgian ports may also for purposes of trade protection be deemed as home waters, and their security guarded with equal care and solicitude.

The great main routes of trade and their normal protection may be tabulated as follows:—

1.—The North Atlantic—East and West, between 40° to 60° N. Lat.—To Canada and Northern ports of the United States. The most important route for food products coming to the United Kingdom. Aggregate trade (imports and exports, United Kingdom, 1895), over this route (some quantity of it may have come over route No. 2), £150,612,036 (Imports United Kingdom £99,949,430; Exports United Kingdom, £50,662,606). This, out of a total trade with the whole world in 1895 of £702,522,065, or, in other words, about 21·5 per cent. of the commerce of the United Kingdom was carried over this Northern route, or, of its imports alone, 24 per cent. This will show at a glance the great importance of this route, and in addition, when it is remembered that upon its waters in the past some of the greatest contests for our supremacy of the sea took place, and probably would again, the necessity for thorough preparation for its defence in time of war becomes of paramount interest. Suggestions will be offered in regard to this route, specially, further on in this essay. The normal force maintained in commission for the protection of these waters is the Northern Division of the North American and West Indies Squadron, headquarters Halifax, Nova Scotia, and which at present consists of one battle-ship, one first-class cruiser, four second-class cruisers, three third-class cruisers, six sloops and first-class gun-boats. The squadron for the defence of the channel, and the Reserve Squadron for the protection of home waters, which should have been detailed when treating of these waters above, is normally as follows:—

The Channel Squadron.		*Reserve Squadron, consisting of First-Reserve and Port-Guard ships.*	
First-class Battle-ships ..	8	.. ..	7
Second-class Battle-ships	0	.. ..	3
First-class Cruisers ..	2	.. ..	2
Second-class Cruisers ..	2	.. ..	2
Third-class Cruisers ..	1	.. ..	0
Torpedo Gun-boats ..	2	.. ..	7
Torpedo-Boat Destroyers	0	.. ..	16

Halifax, 2,400 miles from England, is a fortified coaling station and naval base, with dry dock, and has a normal garrison of two companies Royal Artillery, two companies Royal Engineers, and one battalion British infantry, besides Canadian Militia.

2.—North Atlantic—N.E. and S.W. to West Indies and Southern United States ports. Aggregate trade with West Indies (1895), Mexico and Central American countries, about £18,139,000, mainly exports from the United Kingdom. The Southern Division of the North Atlantic and West Indies Squadron with headquarters at Kingston, Jamaica, (changes at intervals) is charged with the normal protection of these waters. There is a naval station and floating dry dock at Bermuda, 580 miles east of North Carolina, in the United States. A naval station, but no dock, at Kingston, Jamaica, and one well fortified, but also without dock, at St. Lucia (Port Castries). Garrisons of Regular troops are established at Bermuda, Jamaica, St. Lucia, and Barbados, amounting in the aggregate to four companies Royal Artillery, four companies Royal Engineers, four battalions British infantry, one battalion and depôt West India Regiment, besides Militia.

3.—The Channel to Gibraltar, the Mediterranean and Red Sea, to and from Colombo and Bombay.

This is, naturally, one of the most important routes, if not indeed the most important of all. It is impossible to give anything like an accurate statement of the value of the annual trade carried to and fro over this route, as so much of the trade of foreign countries between each other, in addition to that with ourselves, is carried by British shipping. From a summing up, however, of the imports and exports from and to countries whose trade must naturally be, most of it, by this route, one is not far wrong to place £240,000,000 as a low estimate of the values committed to this great route, or about 34 per cent. of our whole commerce with the world. (This is approximate, and is considered by the writer as based upon rather a low ratio.) If, however, this route is the most valuable, it also enjoys the advantages of being the best protected. Gibraltar, a fortress of the first class, is likewise a naval station of prime importance, which will be even still further increased when the three dry docks now building are completed. At this point the waters of the Channel and Mediterranean Squadrons meet. Ships-of-war can here refit and complete repairs, but the roads being exposed to shell fire from heavy guns mounted on the neighbouring Spanish soil render them insecure for merchantmen in the event of our being at war with Spain, unless indeed, as would most probably be the case, the annoyance from the land side was first removed by our forces. About midway in the Mediterranean section of this route lies Malta, the headquarters of the Mediterranean Squadron—the strongest maintained in foreign waters, viz., ten battle-ships, eleven cruisers, with corresponding number of small craft, etc.—with a normal garrison of about 10,000 men—strategically a point of the very greatest importance, lying as it does about 1,000 miles from Gibraltar and Alexandria, and about 700 miles each from Toulon, Trieste, and the Dardanelles. It is situated about 2,280 miles from England

(Portsmouth) and is our leading naval station abroad, possessing two dry docks, with re-fitting establishments of all kinds. Proceeding eastward the great feature of the route is reached—the Suez Canal—connecting the Mediterranean and Red Seas. From years of usage this artificial waterway has now become an essential of trade and commerce between the East and West, though the completion by the Government of Canada some twelve years ago of the trans-continental Canadian Pacific Railway has provided an alternate route of almost equal importance, should hostilities at any time prevent free access and transit by the Suez route. Proceeding down the Red Sea, Aden and the Isle of Perim are reached at the extreme southern end of the Sea. Both places are garrisoned by Imperial troops, and are within the limits of the "area of operation," if one may so term it, of the East Indian Squadron. For the normal protection of this great route there is provided the Southern Division of the Channel Fleet, the Mediterranean Fleet, and the East Indian Fleet, aggregating ordinarily in commission in peace-time thirteen first-class battle-ships, three first-class cruisers, seven second-class cruisers, eight cruisers of the third-class, and twenty smaller craft, a garrison of about 6,000 Imperial troops at Gibraltar, about 10,000 at Malta, 3,000 in Egypt, and 1,500 at Aden and Perim. The East end of the route—Bombay—is fortified and garrisoned, and provided with four dry docks. Karachi, farther to the North, is a fortified coaling station. The close proximity of this route to foreign countries would, in the event of war with a European Power, undoubtedly invite attack and raids upon our shipping in these waters more perhaps than elsewhere. The great foreign stations of Toulon, Trieste, Biserta, and Spezzia would afford facilities for despatching "commerce-destroyers" that would be most dangerous. In the event of war with a first-class European Power, the only salvation of our commerce is to have upon foreign stations an overwhelmingly strong fleet of war-ships, sufficient to destroy the enemy's fleets, and then blockade rigorously all ports from which vessels improvised to harass our shipping might emerge. Hence the best protection to commerce is in the first instance to so strengthen all our squadrons abroad, that they may be able at the very outbreak of hostilities to beat down and destroy all opposition from an enemy's marine forces; secondly, the fleets must be so strengthened in cruisers that no improvised or designed "Alabama," or destroyer of similar calibre, can act the hawk among the chickens of our British mercantile marine.

4.—The Channel to India (Bombay, Colombo, Madras, and Calcutta) *viâ* the Cape of Good Hope, and the extension of the route easterly from the Cape to Australia.

No commercial route upon the globe has played a more important part in the expansion and growth of the British Empire beyond the seas than this old route of the Indiamen, though the completion of the Suez Canal has relegated it to a second-rate and inferior position compared with its one-time proud pre-eminence. If inferior in peace-time, it is, however, during war that this old highway of commerce would speedily be restored to a foremost position, in the event of a hostile seizure of the

Canal, or its being rendered in some way impassable to shipping. The value of British trade passing to and fro over this route aggregates yearly about £100,000,000. It is one that in the event of war would offer special inducements to an enemy's cruisers, though this is somewhat compensated for by the fact that south of the equator there are few foreign coaling stations, and that our ships possess much more advantageous bases from which to watch and guard our merchantmen. Strategically, this route is of the utmost importance, and it must always be imperative that our hold upon the Cape be retained, and our fleets be supreme in all contiguous waters. The French coaling station and naval depôt at Réunion is offset by Mauritius, but they (the French) have lately planted themselves further upon our flank in Madagascar. In the event of war this would be the base for them to operate from, provided they had sent ships out previously, but if not, the disadvantages of the Canal being in all likelihood blocked would be of much greater consequence to them than to us, since they would have to run the gauntlet both at Gibraltar and the Cape before they could get their vessels to the southern waters, should they indeed desire them there. The normal protection provided for this route and contiguous waters during peace-time is: the Southern Division of the Channel Squadron, the Cape and West Coast of Africa Squadron, and the East Indian Squadron. Coaling stations exist at Sierra Leone, St. Helena, Ascension, the Cape, and Mauritius, with Imperial garrisons, aggregating about 4,000 men. The fleets mentioned aggregate 5 first-class battle-ships, 1 third-class battle-ship, and 2 coast-defence-ships, 2 first-class cruisers, 3 second-class cruisers, 6 third-class cruisers, besides small craft. Docks are found at the Cape and Ceylon, and cables at all principal points upon the route, along the African coast. The projected line from Zanzibar to Mauritius should, however, be completed without delay. There can be no question but that in any war of the future, and more especially a naval war, the cable lines will play a most important part. First in importance outside the ships themselves must stand the coaling stations—they will be virtually the keys to the situation, but next to them and running them close will be found the cable lines. At present the cable to the Cape, one of the most important of all our cables, touches at several places on foreign soil. In the event of war this fact alone might prove ruinous to much of our commerce, to say nothing of more weighty interests, since it leaves in the hands of strangers the power at any time to destroy and render useless our means of inter-communication. For the proper protection of our trade and commerce it is essential that if a separate cable cannot be obtained that will not run through any foreign territory, steps should at once be taken to ensure that upon the first hint of actual hostilities the cable should be raised off-shore, both at point of entry and egress, and a loup laid down, so that in the event of any interruption taking place on land the through service to Capetown and other points shall always be maintained. This would not be a matter of much cost and would be simply exercising a little business precaution for an emergency that would in all probability take place. Telegraph-ships for the repair, etc., of cables

should be provided for all our foreign squadrons, and be kept in preparation for instant service. A few pounds spend in this way in peace-time might well be the saviour of millions in time of war.

5.—Colombo to Australia and New Zealand.

a. Viâ Cape Leuwin.

b. Viâ Torres Strait.

6.—Colombo to Singapore and Hong-Kong.

Both these routes are of great importance and growing more so yearly. Both present excellent opportunities for "commerce-destroyers" of large coal-carrying capacity. The many islands of the East Indian Archipelago and the unfrequented waters of the Southern Phillipines and Annam afford many secure hiding-places from which these vessels could prey upon a valuable trade with great audacity and boldness. Our China Squadron has recently been much strengthened, but it is open to question if it is yet as strong as it should be for the preservation of our commerce should war break out suddenly. Of course there is no Naval Power in the immediate neighbourhood to be afraid of, but all the Great Powers maintain squadrons in these same waters, and our fleet to succeed must be in a position at once, on the outbreak of hostilities, to crush and destroy the enemy's ships on the station as well as protect exposed parts of the main routes against incursions of hostile improvised destroyers until reinforcements can reach China and Australian waters from other stations not likely to be liable to immediate attack or danger. Thus, in the event of war with France, it is quite conceivable that assistance could at once be despatched from the Pacific Squadron off the coast of North America to that in Chinese waters, as there would be much less danger from French vessels in the neighbourhood of the former to that in the latter. Again, in the case of war with the United States, the entire Chinese Squadron might be sent off to join that of the Pacific for offensive action in North American waters. This is, of course, put forward in a general way as it is well understood that specific circumstances of the hour and conditions of the time will always govern the movements of our regular station squadrons.

Patrol-ships would be urgently required on these routes, and particularly on the long stretch from Colombo to Port Leuwin—a very lonesome, dreary stretch of water, and one where a raider might expect to be least disturbed in his proceedings. Among these routes, *i.e.*, *viâ* Torres Strait to Hong-Kong, the advice of consuls and shipping-masters as to the best routes to take, and where to expect convoy, etc., would be eagerly sought on the outbreak of war, thus adding emphasis to the necessity of some preconceived plan being concerted and confided by the authorities to the proper persons. The admiral in command of each station would probably be the best one to arrange this, as he could change details as circumstances required with least delay and trouble to all concerned. Thursday Island should be well fortified, and a naval base and depôt established either there or at some point on the North Australian coast. Arrangements should also be made for cutting the French cable to

New Caledonia, should such action be required. Probably the most important shipping point in these waters is Hong-Kong, the wonderful progress of which as a trading port is one of the features of British trade and adventure of the present century. Ceded by the Treaty of Nankin in 1842 by China, Hong-Kong was then but a small unimportant island. In 1895 its trade amounted to over £20,000,000, exclusive of trade in transit, and shipping to the extent of 7,827,398 tons entered the port. It is a naval and military station, possesses five docks within fortifications, and is the headquarters of the British China Squadron, and has a normal peace garrison of about 3,000 men. Singapore is the second great port in these waters. It is a port of call from all vessels coming from China or Japan, or *viâ* Torres Strait, and, as the gateway of the route, would be an important point in the event of war. Its capture by an enemy would mean ruin to much of our trade and commerce in the East, therefore its adequate defence by fortifications, torpedoes, and submarine mines, is imperative. The expenditure of providing and maintaining a battle-ship in reserve, both at Hong-Kong and Singapore, would be a wise move when the great value of our trade at stake is considered. These ships need not be kept in commission, but maintained with skeleton harbour crews ready for instant action. Regular crews could then be made up when required from the smaller vessels of the fleet which could then lay up until reinforcements came to hand. Being so far from home a saving of about twenty days would be effected in this way, and it requires no great stretch of the imagination to conceive times when an efficient battle-ship might, to our people and their interests in distant seas, be worth almost her weight in gold. Their very presence at these points might even influence the prevention of war under certain circumstances. The trade returns for Singapore for 1895 are given as about £57,000,000, and the number of vessels entered and cleared in that year, exclusive of native craft, was 8,603 (Whitaker's, 1897). The Straits Settlements are one of the Colonies contributing to Imperial funds for naval protection and defence. Singapore is a fortified coaling station, and has a normal peace garrison of about 2,000 men. The normal naval strength provided for these waters comprises the China and Australian Squadrons; the latter primarily for the defence of Australian ports and the protection of floating trade in Australian waters. The China Squadron consists of (1896) one first-class battle-ship, three armoured cruisers, one first-class cruiser, four second-class cruisers, two of the third-class, with nine sloops and gun-boats, one coast-defence ship, and two torpedo gun-boats or destroyers. Recently (1898) the "Powerful" and two first-class battle-ships, the "Victorious" and "Barfleur," have been added to this fleet, thus increasing its strength considerably. The French and Russian ships in these same waters in 1896 consisted of five armoured cruisers, three cruisers of the second-class, one of the third, with thirteen smaller craft, of which two (French) were in reserve. Thus to our total ships of twenty-four are opposed twenty-two of the Dual Alliance, a strength sufficient to make our captains very anxious for the safety of trade in those Eastern waters should we be forced into hos-

tilities with these Powers. Fortunately, by our sea-power we control the routes from both France and Russia to these waters, and if war were to occur it would certainly not be the fault of our ships if any reinforcements to the allies by sea were able to reach Eastern Asian waters.

7. Hong-Kong to Victoria, B.C., *viâ* Yokohama.

8. Victoria, B.C., to Australia, *viâ* Hawaii.

Both these routes under normal conditions during peace would be classed as of lesser importance, but, in the event of war, the control of both of them would be of the greatest value to Britain, forming as they do the farther portion of the Canadian transcontinental route, one of the two great alternates to the Orient in the event of the Suez route being blocked or impracticable. The trade from Hong-Kong and Yokohama to Victoria is constantly expanding, and will, no doubt, ere long necessitate more steamers in addition to the Canadian Pacific Railway's "Empresses." These three really fine vessels are all under Admiralty subsidy and regulation, and can be counted on to do a good deal towards taking care of themselves in case of trouble. The run from Victoria to Sydney is a long one, and, as yet, few regular liners are on the route. An important feature in connection with these waters is the probable annexation of Hawaii to the United States and the consequent possibility at any time of finding the islands hostile to us, as they were over 100 years ago to our great navigator and explorer, Captain Cook, R.N. Discovered by our officers and long friendly disposed towards our Government during the early part of this century, it does seem remarkable that these fertile islands should have been allowed to quietly slip through our hands into those of a few Yankee adventurers. Of recent years their strategic value has been enhanced tenfold; they should be our coaling station and cable pier in the Pacific; but as they are not, and their value has been grasped and appreciated by others, we shall have to make the best of smaller and less valuable islands for our purpose. It is too bad though that the Sandwich Islands do not float the "Union Jack" to-day. Of course there is always this consolation, that whoever is supreme in sea power in the Pacific can at any time possess the islands therein, but in the meantime we must do with less favourable coaling depôts, etc., which for the protection of trade and commerce appears to be the principal consideration. The protection of these waters is confided to three permanent squadrons: the China Squadron, already spoken of; the Pacific Squadron, with headquarters at Esquimalt, B.C.; and the Australian Squadron, with headquarters at Sydney, N.S.W. The two latter fleets aggregate two armoured cruisers of the first class, ten cruisers of the third class (of which two are kept in reserve in Australia), six sloops and gun-boats, and two torpedo gun-boats (one in reserve in Australia). In view of the opportunity offered by war to an enterprising ocean free lance with large coal-carrying capacity to operate successfully throughout the broad expanses of the Pacific, it would appear that for the proper protection of our commerce in these waters the two squadrons enumerated should be materially strengthened in reserve ships and guns. Men could most

probably be found in Australia. The ships of the squadrons are too many of a small type—scarcely powerful enough for convoy duty, and should be supplemented by at least two first-class cruisers and a first-class battle-ship—these to be kept in reserve with skeleton crews—the battle-ship and one first-class cruiser in Australia and the other cruiser at Esquimalt. This latter point should continue to be strengthened, as in addition to a dry dock (the only one for our fleets upon the American Pacific) and the naval yard (for supplies and repairs only), it is important as the covering point of the western terminus of the transcontinental Canadian route as well as that of the native coal supply of British Columbia. In the event of war it is quite possible that our fleets in the Pacific would have to depend entirely upon this coal from the Rocky Mountains, which fortunately is of a good quality of anthracite, hence no measures should be spared to render this supply as secure as can be done in peace-time. Coal from Nanaimo (within 80 miles of Esquimalt) of bituminous character is the best steam coal of the softer sort found on the Pacific coast and is largely exported to the United States. In any plans for the protection of commerce in the Pacific the native British Columbia coal supply must form a very important consideration, and the Imperial Government should encourage the output and storage for naval use. For instance, the coaling station at Fiji might be replenished from British Columbia regularly.

9. English Channel to Eastern South American Ports and Cape Horn.
10. Cape Horn to Northern Pacific Ports.
11. Cape Horn to Australia and New Zealand.

The first-named route is a very important one, trade between the United Kingdom and Brazil, Argentine, Chili, and other American countries aggregating £39,562,364 in 1895. With the Argentine Republic alone in 1895 the volume of trade done was nearly £15,000,000, of which over £9,000,000 was exports to the United Kingdom, mainly made up of breadstuffs and other food products. To realise the full value of this route to the Empire, the trade of Canada, Australia, and other Colonies with these countries must be added to the figures above given. In the event of war with the United States, or in which the United States would be involved, the route to Argentine would be one to most carefully guard, in view of the increased import of food products from that country to offset the decline in the same from the United States. In such event it is also a route which would receive much attention from United States cruisers, and in this connection it should never be forgotten that the United States is not one of the signers to the Declaration of Paris forbidding the use of privateers. United States writers make no secret of the fact that in the event of war with the mother country one of the most important means which they would use against her would be privateering, so that in considering the protection of our commerce on all waters contiguous to the United States, full allowance must be made for grappling with this additional feature of the

situation. At all costs the greatest food routes—the North Atlantic from Canada, the Cape to India, the Cape to Australia, the Channel to Argentine—must be kept open and secure, either by convoy or patrol, for British shipping, and this not for vessel-owners and shippers so much as for the comfort and well-being of the masses of population at home. Food for the British Isles *must* be provided; a state of war would naturally increase the prices of breadstuffs, even before a single British vessel had been seized and rifled on the high seas; but a stoppage of these supplies sufficient to raise the price of bread to a figure beyond the means of the working-man, while at the same time the cessation of adequate supplies of raw material (cotton, etc., etc.) would throw them out of work —would be enough to cause a revolution even in law-abiding and prosperous England. The more one thinks of this, the more he is inclined to believe that upon the protection of our trade and commerce depends, not only the continuance of our factories and the provision of cheap food for the people, but in the end the dearest and most prized features of our British Constitution—even the Throne itself. This may seem far-fetched, and the writer hopes it is, but to him the subject appears of such transcendent importance, that to fail to provide adequate safeguards for its security under any and all conditions of peace or war, is to place a premium upon disaster, and to court ruin by our own indifference, lack of energy and foresight. For the protection of trade in South American waters a small squadron is in commission in the South Atlantic. It normally consists of one second-class cruiser and three or four others of the third class—one of our weakest squadrons on one of the most important routes. For the proper protection of trade a first-class cruiser should be added to this squadron. It is not that the hostility of any of the South American countries is to be feared, but many of these Republics possess some of the finest cruisers and other vessels of the most modern type to be found in any foreign Navy—most of them the product of British yards—and it is not at all unlikely that in the event of our being embroiled with any of the larger Powers, financial considerations would induce the owners of some of these fine vessels to let them slip upon our commerce under a new flag. To meet this we should have permanently on the station at least one good first-class vessel, the equal of anything afloat in South American waters. The first-class cruisers already recommended for the Pacific and Australian Squadrons would be able to attend to their ends of these routes in the same way. Some time ago the Press despatches told us of the annexation of Trinidad (the less), a move which was hailed with satisfaction by all good friends of British commerce; but unhappily since that time a change has taken place, and the island which would have been so valuable (provided the details of the place were suitable) on account of its position for both a cable station and coaling depôt, has been surrendered to Brazil as having thereto a prior claim. This was extremely unfortunate,[1] as some such station is badly required along the long stretch from the Channel to La Plata, and it is to be hoped that some such will yet be found and provided.

[1] Trinidad is a barren rock with no harbour or inlet; it might be used as a cable station, but certainly could not be for anything else.—ED.

Recommendations and Suggestions for the Protection of British Commerce during War.

Having treated heretofore generally upon the subject, and shown the great routes of trade to be protected, the writer begs to offer the following specific suggestions:—

1.—The Royal Navy must be maintained in ships and men at such a standard of numbers (their efficiency being taken for granted) as will leave no doubt of British supremacy at sea in the event of any probable combination of hostile Powers.

This is the first great requisite, and without this, in our case, all else falls to the ground. Hitherto the combined naval strength of France and Russia has been the accepted standard for us to surpass, but certain events of recent occurrence make one question if even this standard is a sufficiently high one for our safety. The Navy of the United States has recently been put upon a modern footing, and though it is lamentable to contemplate the great Trans-Atlantic English-speaking Republic in arms against her mother land, it is the height of folly for us to shut our eyes to the fact of the bitter hostility of a large and influential section of the United States people. That this is due to envy and jealousy of our British institutions, our democratic freedom though monarchical, our growth and progress, as well as the rivalry of trade, is unquestionable, as is also the fact that the better class of United Statesmen are friendly to Great Britain, but, at the same time, these are not the men who preside in Congress, and signs are not wanting that an alliance with France and Russia, in the event of our being at war with these Powers, would not be so very improbable as it may appear at first sight. To the writer it does seem that in adopting a standard of naval strength it would be wise to consider other Navies than those of Continental Europe, and for this purpose the Navy of the United States should be bracketed with those of France and Russia. To excel the sea strength of these three Powers should be our aim, and not till that is done beyond question should our authorities feel satisfied that they have done their whole duty in safeguarding the most vital interests of the peoples of the British Empire.

2.—Foster a more general co-operation of the Colonies in regard to defence generally—more specifically as making their ports better naval bases—and educate them to an appreciation of the fact that this should be their contribution to the defence of their own trade and commerce.

In all schemes for the protection of commerce by the Royal Navy it is taken for granted that that commerce includes all of each and every Colony of the Empire, and not that of the United Kingdom only. For this protection the Colonies at present contribute little or nothing, something under £290,000 being the annual amount contributed for this purpose in a total appropriation of some £22,774,000 (Gross Estimates, 1896-97.) Colonial shipping in "Lloyd's Register, 1896-97," is given as amounting to 1,065,487 tons, in a total British shipping of 13,359,026 tons. Thus, while their shipping to be protected amounts to about one-thirteenth of the whole, the colonial contribution for its protection

amounts to but about one-seventy-fifth part. It is not, however, advisable that any general scheme of direct colonial contribution to the support of the Royal Navy should find favour, as it is certain such would not be possible, in the case of the large self-governing Colonies, without an adequate voice by representatives of such Colonies in its distribution and management. This, of course, could never be permitted, unless some kind of Imperial Council or Parliament in which representatives would convene from all the outlying parts of the Empire was first established. Hence, the question of control would most probably bar any general *pro ratâ* scheme of financial contribution; but, the Colonies can on their own soil and in their own waters very effectively aid in Imperial Defence and the protection of their own and Imperial trade and commerce by strengthening their ports by land, torpedo, and submarine-mining defences, thus rendering them better harbours of refuge for flying merchantmen and more valuable naval bases from which the Imperial fleets may operate and be victualled and supplied. In the case of Canada, which has by far the largest tonnage of colonial shipping, much could be done along her Atlantic maritime and lake coasts. In 1895 fishermen to the number of 30,808 received fishing bounties from the Dominion Government to the amount of 163,567,99 dollars. This payment represents the interest for the year upon the award of 4,500,000 dollars paid to Canada by the United States, under the Treaty of Washington, Halifax Conference, 1877. It would seem to the writer that a very little addition to this bounty should secure the best of the majority of these men as a kind of Marine Militia or Naval Reserve, the presence of the North Atlantic and West India Squadron at Halifax and in neighbouring waters for a certain time each year, affording facilities for training officers and selected men that should not be lost sight of. In thus assisting Canada to help herself in protecting her own ports and commerce, indirect strength would be added to the Royal Navy, inasmuch as a scheme of this kind would release a certain portion of the fleet for work elsewhere.

3.—Our squadrons on all foreign stations should be kept always at a sufficient strength in fast cruisers of the first class to permit each squadron in its own waters, immediately upon the outbreak, or probable outbreak, of hostilities, to seize all fast liners and merchantmen which might be improvised, if not so secured, by the enemy as privateers or commerce-destroyers.

The necessity, urgency, and ultimate economy of this course will be at once recognised when it is considered that one first-class modern liner like the Messageries Maritime steamers to the Orient or the American Line boats upon the Atlantic, could by reason of its speed and great coal-carrying capacity, when armed with quick-firers (which are said to be now being prepared), do a vast amount of destruction to floating trade in a very short time along the frequented highways of traffic. The only guard against such havoc is to have close at hand faster and more powerful cruisers to head off as quickly as possible any such attempts *à la* "Paul Jones."

4.—Sufficient ships should be kept in reserve—with an adequate number of extra men on the strength of the station—at the chief naval depôts abroad to permit of convoy duty being at once taken up on the notification that war has been declared, without materially weakening any particular squadron for offensive action in the neighbourhood of its own waters.

During war the main dependence of our commerce must be upon the convoy, either over the more exposed portions of the route or throughout its whole extent. Even before any actual seizures of our ships will be made, owners and the shipping interests generally will naturally look to the nearest squadron of the Royal Navy for protection. Convoy duty on the North Atlantic and Cape routes will be of the greatest importance, and, owing to the immense increase in business and the necessity for the uninterrupted importation of such large quantities of food products for the people and raw materials for home manufactures, will place a very heavy strain upon the Navy, unless some special provision be made for it in peace-time.

5.—An adequate reserve should be constantly maintained at home to form blockading squadrons for the enemy's important ports, arsenals, and ship yards, and flying squadrons for the patrol of frequented open ocean spaces.

In the event of war, one of the very first requisites for the protection of trade and commerce upon sea is the blockade or sealing up effectually of all ports, naval stations and yards from which ships could issue to prey upon our trade. This, too, quite in addition to the squadrons permanently in commission, whose immediate and imperative duty will be to seek out and destroy the battle-ships and organised naval forces of the enemy. Of course it will be manifestly impossible to blockade *all* ports, but, certainly, provision should be made for so treating all important ones and thus rendering an enemy's yards and naval stations as harmless to floating trade as possible. None of our regular squadrons should at the outbreak of war have to weaken themselves by blockade service, but should be rendered independent of this by the provision of other ships, whilst they assume an energetic offensive from the very start. Outside of the regular routes of trade, previously enumerated, there are many by-ways of traffic and subsidiary routes, particularly for sailing-ships, which would be quite out of the way of the regular squadrons. For these patrol-ships would have to be provided. These should also be considered beforehand, so that the outlying squadrons might not be further weakened by detaching isolated ships for cruising in the open spaces. All this, of course, means lots of ships, lots of men, and lots of money; but if our trade and commerce is worth saving, it can only be saved by prompt action at the outset, and by the provision in peace-time of an adequate force for its protection all over the world along the frequented highways and great avenues of traffic.

6.—Measures should be devised and put in force without delay for the encouragement of British seamen and the increase of their number upon British ships throughout the world.

In the event of war, it is quite probable that a disquieting feature in the form of the paucity of British seamen, *i.e.*, English-speaking native Britishers of the United Kingdom or self-governing Colonies—would present itself in many instances. Coolies and Lascars are all very well in fine weather, and in peace-time save money for the shareholders of shipping lines; but it is very gravely to be doubted if in war-time with a strange cruiser creeping up behind, any saving would be found by employing them. The preservation of our shipping has grown to mean much more to the masses of our people than to the shareholders of companies, and it really seems that the time has now come when the Government should step in, and in the interest of the nation say, "Cheap or not cheap, you must employ British seamen, or such and such proportion of your crew must be white English-speaking men." For the due protection of our trade in war-time this has become an essential. Where would we hear again of a gallant re-capture of a P. & O. liner, manned almost entirely by Coolies, from an enemy's prize crew, such as makes one's heart warm to the plucky fellows of the old East Indiaman in the French wars of the opening years of this century? Give us measures to ensure more of our good English-seamen stock upon our ships—of course, he wants more money than darkies, and will get drunk, of course, and be more bother to his officers, etc., but thank God his blood is warm, he will not go back on you in a "norther," and he will fight and protect our trade and commerce as no other living man can, if he but gets half a chance. Do something to get more of him back upon our mercantile marine.

7.—Encourage in a greater degree the Royal Naval Reserve.

In the event of war all authorities are pretty well agreed that to man our fighting-ships and those engaged in blockade, convoy, and patrol service, will place a very severe strain upon our sea service, and this, of course, will be added to very shortly after the outbreak of hostilities by casualties of all kinds. There seems little reason why the great majority of our seamen on merchant-ships and the fishermen of the United Kingdom, Canada, and Newfoundland, as well as those of Australia and New Zealand, should not be members of the Reserve actively, as of course they already are dormantly, if such term may be used in this connection. It would, perhaps, be difficult to train at all effectively, under modern conditions of service, such large numbers of men scattered as they are throughout the Empire; but, as organisation is a good deal, and a little training better than none at all, it would be a great factor in the protection of our trade to institute some organisation in the form of a marine militia to supplement the present Royal Naval Reserve. The present system should be extended, particular care being taken to obtain the stokers, artificers, and engineers upon the liners as reserve men, in addition to the seamen. More encouragement should also be extended to the officers, and shipping companies educated to the fact that it is in their own interest to have officers of their ships who belong to the Reserve and have some little naval training. Were the cream of the fishermen formed into a naval militia there can be no doubt of their practical utility in the event of war. For coastguard service they should be invaluable, and, if

properly officered and handled, could permit of ships and men of the Royal Navy otherwise engaged in guard duty being delegated to the offensive squadrons. Canada and Newfoundland have in the neighbourhood 70,000 hardy fishermen—men of the north—who could furnish some of the very finest raw material for naval purposes in the world.

8.—The enactment by Government of regulations to the effect that all British steamships (and sailing-vessels as much as possible) shall be fitted up with electric search-lights, and the issue of an approved signal code for use in the event of war and chase by an enemy's cruisers.

Modern improvements give to merchantmen chased by an enemy better opportunities of communicating with friends and soliciting assistance than were possessed by their predecessors formerly. With the heliograph in daytime (of course only in fine weather) and the electric light at night, a ship knowing she was somewhere in the vicinity of a convoy or patrol-ship might often escape capture; whereas without these means of communication she might be lost even though overwhelming assistance was comparatively close to her. With an established signal code this could not occur.

9.—Extend the retaining system of ships as much as possible, providing guns and fittings for all ships so retained and depositing one-half of such armaments at each terminus of their regular routes (if such termini are in British territory). Encourage owners of large ships and established lines to build new ships under Admiralty supervision, so they may be more useful and better fitted to take care of themselves in the event of war. Provide better means abroad for more frequent training of Royal Navy Reserve men, and all seamen on retained ships, than they now receive.

At present twenty-eight steamers of passenger and merchant lines are held at the disposal of the Admiralty for armed cruisers in the event of war, eleven of them receiving a special subvention or retaining fee for such purpose. It is to be hoped that Q.F. guns and fittings for the first eleven ships are already provided and stored at the most convenient points for them, and that the armaments for the others are under way. In the event of war these vessels will be called upon to play a bold and very important part. Armed and equipped so as to beat off any small craft or cutting out expedition in a foreign harbour, etc., their speed will ensure them immunity from the majority of an enemy's heavy ships, and enable them to dispense with convoy. As despatch-vessels and transports they will prove invaluable, and possessing such large cargo space they should be of great service in coaling war-ships or supplementing their supply of fuel at sea when time will not admit of the latter going to a distant port for that purpose. In transporting the sick and wounded back from the fighting squadrons they should also do good service, and in every way where a saving of time and great carrying capacity is required. All new large modern steamships should be built with an eye to their possible future service with the fleets, or with an insurance of their added safety in the event of war by being built under Admiralty supervision. Greater facilities, however, for training the seamen (Royal Naval Reserve men) should be afforded at colonial points abroad, so that men who are serving

in vessels plying between points abroad may not be too long without training because of absence from the United Kingdom. The Admiralty regulation requiring a fixed number of men on each ship retained to belong to the Royal Naval Reserve should be amended, and the number of Reserve men so required increased by at least one-half. Strictly speaking, all the crew should be Reserve men, and it may be possible to obtain this in course of time, but to begin with an increase of one-half is advisable.

10.—Furnish all British Consuls and Vice-Consuls abroad, for the information of masters of British ships, with the general plan of the Admiralty's scheme for the protection of commerce and floating trade in the event of war, so they may have a general idea where to expect convoy and the nearest assistance in any particular waters on any sudden outbreak of hostilities; also the best routes to take to complete their voyages.

In a shipping that is so extensive and diversified over the whole world as is that of the British Empire, it is absolutely necessary for its proper protection in case of war that a general scheme should be elaborated and promulgated to all our representatives abroad, so that captains of ships would, upon a sudden outbreak of war with a first-class Power, have some guide to go by in a systematic way, rather than act like a covey of partridges when the dog gets suddenly amongst them. They should then be provided with the war signal code, as previously mentioned, and informed where and when convoy might be expected, etc. Subsidised ships would at once depart in hot haste for their guns, etc.

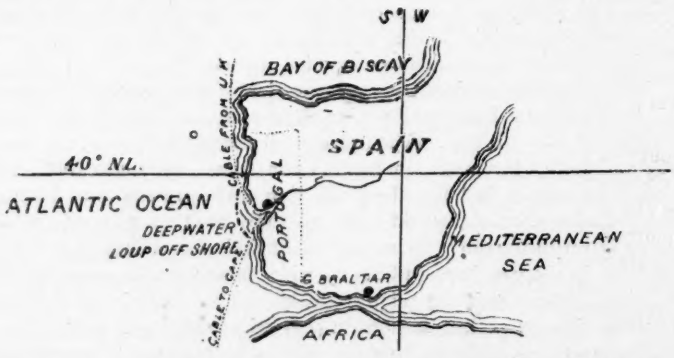
11.—Continue and augment the fortification of existing coaling stations and secure as many others near exposed portions of the great trade routes as possible, so that patrol-ships and others may not have excessive distances to go for fresh supplies of fuel.

In any modern maritime war the question of fuel supply is the most vital, for no matter how grand a triumph of skill and science the completed vessel may be, how efficient and well trained her crew, nor how costly and perfect her motive power and armaments, without regular and adequate supplies of fuel, for offensive action or the protection of floating trade and commerce, she would be of no more use than a log of timber floating idly with the tide. Fortunately for Britain, her statesmen and seamen have in the past been sufficiently wide enough awake to grasp this truth at an early stage in the reign of steam, and the majority of the most favourably situated coaling stations in proximity to the great ocean highways belong to her. These, however, have to be rendered secure against hostile attack in the event of the covering fleets being for any reason drawn off, a plan of operations which would, no doubt, be favoured by an active and enterprising enemy for the very reason that could the coaling facilities of our fleets be injured or destroyed, corresponding injury would be inflicted upon the fleets themselves by thus restricting their radius of action, etc. The plan already being followed by the Imperial Government, viz., the gradual improvement of these stations, their fortification against possible attack, and storing with large deposits of the best Welsh steam coal, should be continued every year, so that upon any outbreak of

war these foundations upon which would largely rest our maritime supremacy in such an event, at any rate in distant seas, might not be quickly sapped and undermined. At the same time the various Colonies having coal areas producing a fuel coming up to Admiralty requirements should be encouraged to provide facilities for furnishing the same at convenient points for Her Majesty's ships. Newfoundland is said to produce a good steam coal; Nova Scotia has plenty, though most of it is rather inferior in quality for war-ship use. British Columbia has at Canmore, in the Rocky Mountains, an excellent grade of coal (anthracite), which should be of great use to our Pacific Squadron. All these points should be looked into and data on the subject collected by the Admiralty, if such has not already been done, as the supply of good coal has a heavy and most direct bearing upon the proper protection of trade and commerce.

12.—Extend present cable from Halifax to Bermuda, to Jamaica and St. Lucia, and build one from Zanzibar to Mauritius, and from Vancouver to Fiji, New Zealand, and Australia, and provide loups for present cables in every case where they touch and cross foreign territory.

Means of rapid intercommunication between various parts of the Empire is absolutely an essential feature of our scheme of defence, and for the protection of commerce it is more so. Our own cables should all be carefully guarded by loups, and information collected of the whereabouts, landings, etc., of all foreign cables, so that, if need be, the dangers to be dreaded from them could be nullified as much and as quickly as possible. The suggested loup system is simply something after this fashion:—



In this case example is taken of the cable running into Lisbon, and from thence on to the Cape. The dot and dash line denotes, roughly, the loup laid in deep water, and which in the event of communication being interrupted on shore would still leave a line by which messages to more distant points could be sent and received. This should be done quietly and without advertising of any kind, and be repeated on all British cables touching on foreign soil. In the case of cables to the United States, it is an important fact that every cable, except one which lands at St. Pierre et Miquelon, touch on British territory, either Canadian or

Newfoundland, and so are largely in our power. It is not likely that loups will be attempted on these cables, most all the companies and their directorates being largely British; but in the case of British cables touching on foreign soil, a loup should be put in wherever practicable and possible. In the day of trial nothing will be found of more service for the protection of trade and commerce than this, as it can be easily surmised that a few days' or even hours' delay might often in war-time mean a loss infinitely greater than the cost of cable loups and the special vessels to lay and care for them, etc. The moral value of having these direct and uninterrupted means of communication will also be very great, and help to stiffen the backs of shipowners against the temptation of transfers to neutrals who possess no such cable lines, and to whom at any time by our authorities the use of our lines might be discontinued. The importance of the Pacific cable was strongly emphasised by the delegate of the Colonial Conference in Ottawa, Canada, some few years ago, to which the probable annexation of the Hawaiian Islands to the United States adds in a still further degree.

13.—Arrange with the Governments of Canada and Newfoundland to make some use of the splendid reserve of raw naval material represented by the 70,000 fishermen along the maritime coasts of these Colonies.

This matter has already been touched upon, but it seems so reasonable and fair that the Colonies having the protection of their commerce guaranteed by the Royal Navy—for it is virtually so—should assist in some practical way in its protection, seeing they pay nothing directly or indirectly for it. The seamen of Canada and Newfoundland have been specially selected from amongst all the Colonies on account of the hardy manhood, bred in the northern climates and brought up in the vigour-imparting and bracing airs of the North. It is true that in modern fleets what is wanted is more often stokers and artificers than sailors, such as are the colonial fishermen, but at the same time some organised effort should be made to render these of use when required. France keeps up her bounties to her fishermen on the banks and the treaty shores of Newfoundland mainly as a nursery for her Navy; but where France has hundreds, Britain could have thousands, if but a little systematised encouragement was offered jointly by both the Imperial and Colonial Governments. That these men would be a valuable adjunct, not only to the defences of the Empire, but also in the protection of trade and commerce, if but trained, properly officered and handled, will be accepted without argument by any who have seen and moved among these hardy sons of the banks and northern seas.

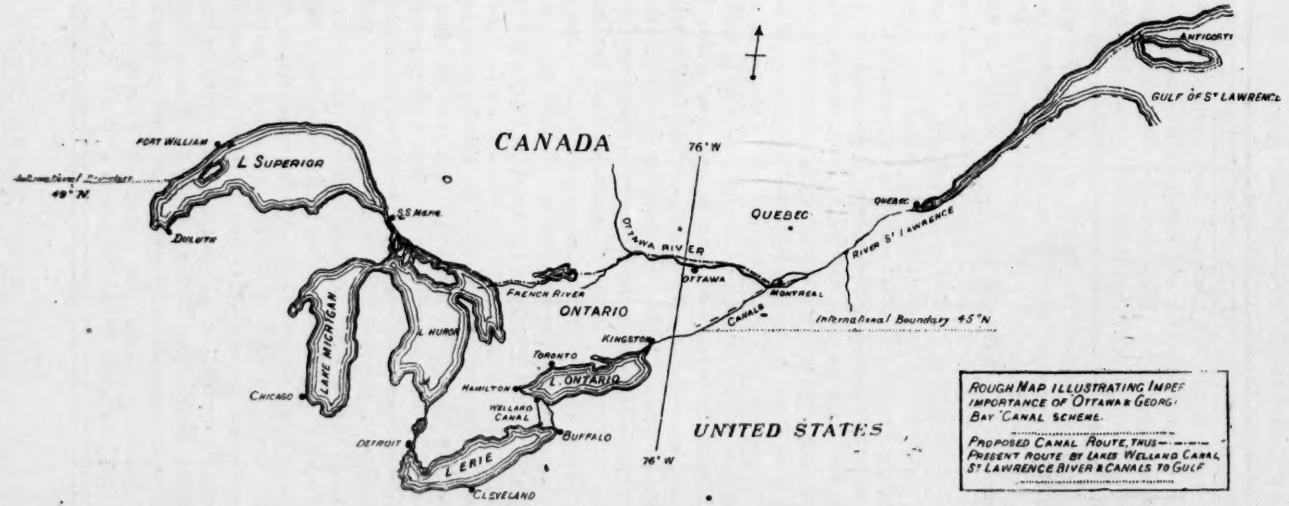
14.—Encourage and assist Canada to construct the Ottawa and Georgian Bay Ship Canal as an Imperial work.

In the event of war it is not only upon the salt seas that protection of trade and commerce has to be considered—there are large inland seas of fresh water, nearly 2,000 miles from tide-water, within the territory of the Empire's leading Colony, and down which a large quantity of the raw food products of the United Kingdom (*i.e.*, destined for consumption within the United Kingdom) are floated to the sea. These food products

are constantly expanding in volume, and it is a safe prediction that before many years the major portion of the imported food products of Britain will come from the prairies of Western Canada. These inland seas border upon the shores of an envious and jealous rival, who, although she acknowledges the United Kingdom as by long odds her best customer for her exported goods, spares no pains to show her enmity and dislike to British dominion upon the North American Continent. Of course it may never go further than that, and all good Britishers will fervently hope and pray it may never do so; but the ways of diplomacy are devious, complications may force the United States into an alliance against us, and a thousand and one things go to show that certain influential parties in the Republic would not be averse to her doing so. With all this as facts it would be folly for us not to consider how our interests would be effected on these great inland seas were the United States in an unfortunate moment to take up arms against us. The outlet from the Great Lakes is by the St. Lawrence River to the gulf of the same name and North Atlantic Ocean, and is for most of the way entirely through Canadian territory. The small rough drawing (Map 1) herewith shows the connections between the lakes and the situation of existing canals at points where such aids to navigation are found necessary, as well as the new route advocated for the Ottawa and Georgian Bay Ship Canal.

The present route from the Great Lakes to the sea is through Lake Huron and St. Clair by the Detroit River to Lake Erie, thence by Welland Canal (in Canadian territory, but within a few miles of the United States border throughout its entire course) into Lake Ontario, whence the Gulf of St. Lawrence is reached by the river of the same name, and its canals in that portion of the stream between Kingston and Montreal. For the successful defence and protection of Canada, military opinion strongly inclines to the opinion that the possession of the lakes and an uninterrupted line of communications by water are essential. In the event of war with the United States the very first thing to be done should be to place an adequate flotilla of small, swift, and heavily-armed gun-boats upon these upper lakes, both to prevent incursions upon our lake shipping and also to hold the large and mostly defenceless cities of Buffalo, Cleveland, Detroit, and Chicago, as hostages. This flotilla could not directly prevent invasion, but indirectly their presence would have a most deterrent effect upon the United States. At present the route to the lakes would, in case of war, be very precarious, and it is extremely doubtful if the Canadian Government could act sufficiently promptly to save and hold the Welland and Beauharnois Canals against the powerful attack that would undoubtedly be quickly made upon them by the United States forces. The United States authorities fully appreciate the importance of the Welland and what it means to them in the event of war. But while the odds seem against us, notwithstanding that the keys to the situation are on our ground, still, we have geographically, in reserve, one may say, another and much more superior route, which if completed would place us beyond question in a position to control the lakes. This is the route by the Ottawa River from Montreal, *viâ* Mattawa River (a

MAP I.


CANADA
UNITED STATES
L SUPERIOR
FORT WILLIAM
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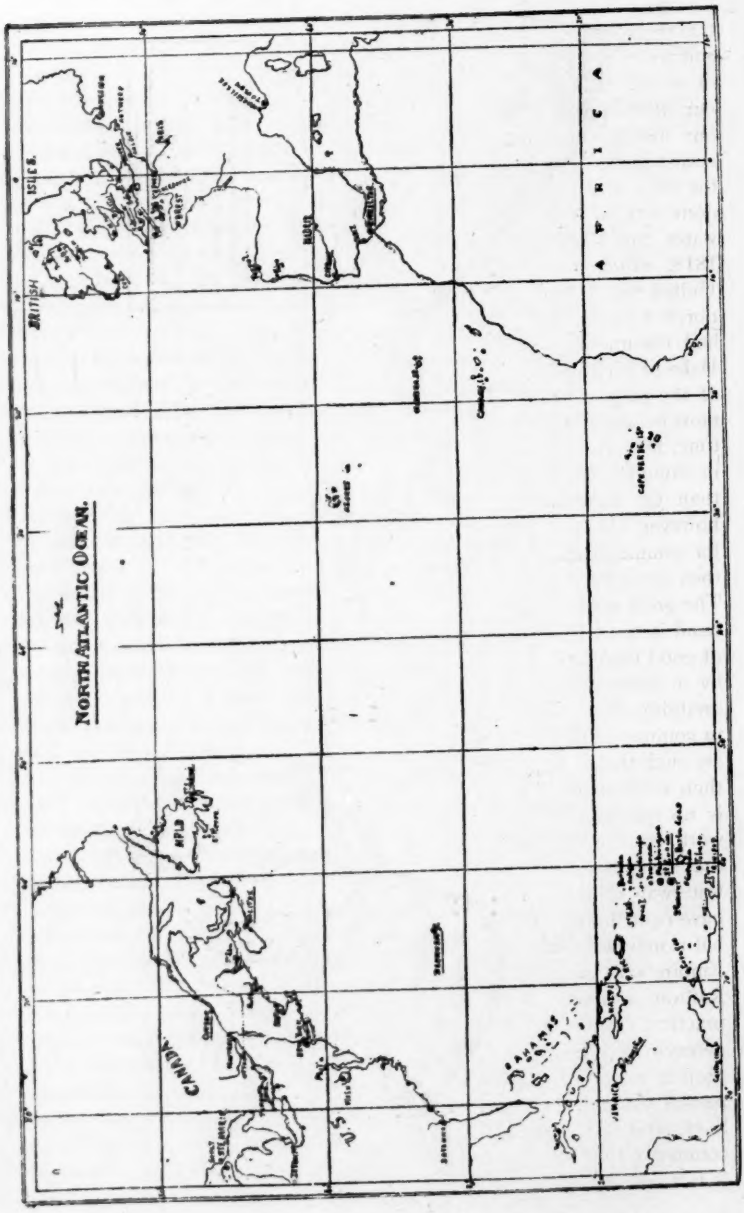
49° N.
SS Marie
L HURON
LAKE MICHIGAN
CHICAGO
DETROIT
L ERIE
CLEVELAND
BUFFALO
WELLAND CANAL
HAMILTON
TORONTO
L ONTARIO
KINGSTON
ONTARIO
FRENCH RIVER
OTTAWA RIVER
OTTAWA
QUEBEC
MONTREAL
CANALS
RIVER St LAWRENCE
QUEBEC
GULF OF St LAWRENCE
ANTICOSTI
76° W
76° W
International Boundary 45° N
ROUGH MAP ILLUSTRATING IMPORTANCE OF OTTAWA & GEORGIAN BAY CANAL SCHEME.
PROPOSED CANAL ROUTE, THUS
PRESENT ROUTE BY LAKES WELLAND CANAL St LAWRENCE RIVER & CANALS TO GULF


NORTH ATLANTIC OCEAN.
BRITISH
ICELAND
NORWAY
RUSSIA
EUROPE
AFRICA
CANADA
U.S.A.
MEXICO
CUBA
HAITI
JAMAICA
VENEZUELA
BRAZIL

tributary of the Ottawa), Lake Nipissing, and the French River to the Georgian Bay. The route is wholly within our territory, most of it hundreds of miles back from the frontier, would not be difficult of construction for medium craft, requiring only some twenty-nine miles of actual canal, and, if completed, would permit of us concentrating our effort in time of war upon more likely projects than frittering away our strength along a long line of canals difficult to defend and easy of access to the enemy. With a naval depôt established on Lake Nipissing, the lakes at any time could be ours in twenty-four hours. This could be done without violating any Treaty, as Lake Nipissing is entirely an inland water, and is not included in the Great Lakes mentioned in the Treaty of 1818, which provides for the armament which Great Britain and the United States shall maintain there. This is no radical or erratic scheme, nor is it a new one. As long ago as 1810-11, H.R.H. the Duke of Kent had favourably commented upon the value of such a work. The Great Duke of Wellington was also, if not exactly an advocate, a staunch friend of the proposition, as was General Sir John Michel one of the ablest and most energetic Commanders of the Forces ever sent to Canada. At that time, however, settlement in the Canadas was scant and immigration set in along the St. Lawrence frontier and shores of the Great Lakes, rather than the back woods of the Ottawa and Lake Nipissing. Time has, however, changed all that. The Rideau Canal, built as an Imperial work for communication with the Lakes *viâ* the Ottawa and Lake Ontario, was then considered ample for the purpose—to-day it is comparatively useless. The great natural route, saving hundreds of miles and giving us the whip hand in the Great Lakes, is within our territory, with its hundreds of miles of good river and lake navigation, requiring simply to be supplemented by a comparatively small amount of canal building proper and river dredging, etc. At present a company is endeavouring to procure capital to commence this great work, and the benefits to be derived commercially are such that it is reported some English capitalists have already signified their willingness to provide funds, if the Government will assist. There is no question but that the Government of Canada will assist in this work, but the ultimate results are bound to be of such Imperial import that some assistance, such as was accorded in the building of the Rideau waterway, might be given by the Home Government. Canada may not have contributed much towards Imperial Defence in direct money votes, but it must be admitted she has done much indirectly. In presenting the Empire with an alternate route to the Orient *viâ* the Canadian Pacific Railway, and now, if she undertakes this, in giving Britain what must be practically the control of the Great Lakes, she will have done much for defence and much for the protection of trade and commerce. This project is worthy of Admiralty recognition and support. More tonnage passed through the Sault Ste. Marie Canal last year than through the Suez, and it is expanding yearly. For the protection of trade and commerce it is felt that the new canal *viâ* the Ottawa and Georgian Bay is fast becoming a necessity.

Conclusion.

The modern day in which we live is essentially a progressive one—everywhere it is "forward" to higher, better, and more perfect excellence—he who waits and lags behind is lost. The wise business man insures his goods against loss by the elements, and the individual his life for the protection of his family against disaster in the event of the occurrence of the unexpected, but the man is counted foolish indeed in these days who does not increase his insurances in a corresponding ratio with the growth of his business or private fortune. He insures against that which he cannot help himself, and which Governments leave to private enterprise to mitigate and settle. Governments undertake to guard their citizens from outside interference or internal disorder for the maintenance of law and order, and the protection and security of property and common interests from aliens and strangers. And, just in the same way as the wise business man adds to his insurance policies as his business expands, so should Governments increase their expenditure for the national insurances in the form of Naval and Military Estimates, as trade expands and the national prosperity increases. A rich, prosperous individual walking abroad in a city begrudging or neglecting the expenditure for policemen would before long be attacked and robbed—wolves always like to find the fat lamb without a shepherd. Nations and Governments are after all very much like individuals, and a rich city, rich territory, or rich trade, without adequate protection, soon excites envy, and a desire to possess the same from the very ease apparently with which it may be acquired. And so it is with the protection of commerce. A trade which is the envy of the world and a shipping which to many of the nations is a mortification and cause for jealousy, when both are combined under the one flag, requires naturally much protection, for otherwise the ease with which it might be diverted to themselves is a snare and temptation to war to nations, with little to lose and much to gain by plunder and disaster. The annual expenditure on the Royal Navy is Britain's chief national insurance, and the policies must be increased generously as our trade and commerce grow year by year. The present proud position of the United Kingdom and the Empire in the van of civilisation, with a wealth and influence far outstripping the wildest dreams of our plucky forefathers, must be maintained, and even pushed further to the forefront as the years pass by. This has not been a thing of yesterday, but represents the culmination of the best efforts of our race for centuries, and, in the event of war, would rest upon and for the future be determined by the protection of our trade and commerce. Our fathers, with a courage and endurance far beyond that which we at the present day are called upon to exhibit, went into unknown seas and lands, planted the flag, preached the Gospel, established trading posts, amidst all kinds of discouragement both physical and moral, with means which, beside our national affluence of the present, seem poverty indeed. Shall we not then, enjoying as we do the fruits of their labours, be as stout of heart as they, and both willing and able to protect and defend, on sea or land, all those riches of trade and commerce

which have come down to us as a national heritage to be expanded and increased as time goes by? With war imminent there can be no doubt what the national answer would be, but with everywhere the unruffled calm of peace it is difficult to rouse the national mind to a conception of its duties in respect to warlike requirements when heavy sacrifices on the part of individual tax-payers are necessary to provide the requisite funds. In this connection, if it were at all possible, an Imperial tax of some small nominal amount upon all imports, except bread-stuffs, food products, cotton, and some other articles of raw material that might be specified, should be exacted universally throughout the Empire in addition to all other local taxation, etc., and devoted to form a "Commerce Protection Fund," to be administered by the Imperial House of Commons, or Admiralty, as the body best suited to view impartially the pressing needs of any particular Colony in relation to the protection of its own trade in conjunction with that of the United Kingdom and Empire as a whole. A fund of this kind would be more fairly and evenly contributed to by all sections, would in a few years provide a handsome sum, and place at the disposal of the Admiralty constantly funds wherewith to store up in reserve those necessities for the proper protection of our trade (which in a feeble way have been enumerated in this paper) without having to appeal so often to Parliament and find the most momentous matters dependent, perhaps, upon the whims and caprices of a factious opposition. Our trade and commerce are too important—they are, in fact, our nation's very life—to be left to take any chances. Our authorities, and those responsible for the administration of affairs, must make certain that every adequate protection that human foresight, ingenuity, and funds can provide for its safety in time of war is provided during peace, for only in this way can security be obtained. "What we have we'll hold" is the true sentiment of our people; but in these days sentiment is not enough—means *must* be provided to enable them to do the holding, and where the spirit is willing the flesh should also be sustained and strengthened. In the ruling and governing of such an Empire as is ours to-day, our legislators and executives have a most onerous task, one well worthy of our best men's best efforts, and with the diversity of interests, conflict of sections, and variety of opinions that prevail throughout its vast expanse, will often find themselves puzzled to know what to do for the best; but, as regards the weighty and important matter made the subject of this essay, their way is very plain if but they appreciate at its true value that gem of wisdom uttered by our distinguished countryman, Sir Walter Raleigh, and which is placed at the head of this paper. No more fitting quotation could conclude it.

"He who commands the sea controls trade and commerce; he who controls trade and commerce commands the wealth and riches of the world; and he who controls wealth controls the world."

THE BATTLE-DRILL OF INFANTRY.

By Major A. W. A. POLLOCK, Retired pay, Late Prince Albert's (Somersetshire) Light Infantry.

Thursday, March 3rd, 1898.

Major-General H. M. BENGOUGH, C.B., *p.s.c.*, in the Chair.

THE grinding tyranny once exercised by the normal attack formation resulted in a drastic revolution, with the usual consequences. In short, we have gone to the opposite extreme, to such an extent that many now find themselves unable to distinguish between "normal attack" and "applied drill." There is a very wide and strongly-marked difference between making tactics subordinate to drill, by the slavish observance of stereotyped forms of procedure, and using drill, properly, as a valuable aid to the solution of tactical problems. "Normal attack" is like a bad bootmaker, who endeavours to compel feet to fit boots in place of making boots to fit feet. The use of applied drill, upon the contrary, is merely to take advantage of certain convenient evolutions in order to facilitate particular manœuvres called for by the battle conditions of the moment.

For example, when a company, marching in fours—say due north—forms to the front and extends a named portion of its strength, it clearly applies to the purposes of the battle an elementary evolution previously learned at drill. The need for putting in practice this particular evolution having duly arisen, it can at once be executed with regularity and expedition, simply at the word of command, without any additional explanation. I venture to contend that much drill, equally applicable to the battle-field, could be added to our Drill-Book with great advantage. For instance, taking the case of the company marching in fours due north, and extending, *after* forming to the front; let us suppose that the same company, marching north as before, desires suddenly to extend facing, say, north-west. There is no word of command now included in the Drill-Book which would instantly transform that column of fours marching north into an extended line facing north-west—no, nor even north! Yet what is more simple than to say, *Single rank* (or at —— paces) *front form*—or "half" or "quarter right," or "along that ditch"? Nothing can be easier, provided that the evolution has been previously practised at drill, but without such previous practice the majority of companies would make rather a mess of it. Readiness of resource upon the part of the company commander is greatly assisted if the execution of the selected expedient

can instantly follow its conception, at the word of command, instead of needing explanations. Initiative is frequently paralysed by the lack of ready means to give it effect. I observed an instance of this not long ago at Aldershot. A company had been placed in single rank to fire on an advancing enemy. About 20 yards to the left front of the company in question was a small plantation, surrounded by a low embankment. Whilst engaged with the enemy in front, the officer in command was informed by one of his men that a hostile detachment was coming on through the plantation. The course to be adopted should have been clear. That company, as a whole or in part, should have instantly lined the embankment, when being themselves sheltered by it, they could have denied it to the enemy and kept him back in the plantation. The trees were small, and could have given him no protection. Had I commanded that company, I should have said, "Behind that bank, rally!" My men would have run at top speed, and been in occupation of the bank in a moment. But what the officer in command actually did was this. He gave the order, "*Left-half company, rise!—about-turn! half-right-form, double-march!*" The result was that by the time he had completed his manœuvres, the enemy had gained the bank instead of being forestalled; consequently an umpire ordered the company to retire, because being in the open, 20 yards from an enemy under cover, its position was obviously untenable. But had the drill of that company been equal to the emergency, the cumbrous method actually employed would have been unnecessary, and the action taken would not have been "too late." We may rely upon it that the battle-drill of the future should be what may be termed "loose." This does not mean that the idea of preserving order and regularity may now be neglected—quite the contrary; but that, as in former eras, mobility will mean superiority. When drill was stiff, the troops that could drill best had the advantage; and so it will be now, when it needs to be more elastic. The troops that have been so trained that they can adapt themselves to circumstances more speedily than their opponents, and quickly regain their order when it has been lost—or, in other words, the troops that are the better trained and disciplined—must clearly possess an initial superiority. The modern attack must usually proceed by the occupation of successive positions, as stepping stones, and often the opportunities will be fleeting, and the methods of grasping them widely different. Very many situations likely to present themselves in battle can be clearly foreseen, and where such is the case, methods likely to meet them should be practised, because time will thus be saved owing to well-known words of command conveying ideas that could only be imparted otherwise by minute explanations. For example:—A company is behind cover, in front of which is an impassable obstacle, say, deep water or a bog. The obstacle is of limited extent and can be turned, or perhaps, in the case of water, there is a convenient foot-bridge. The firing line is disposed behind the cover, and the distance from the enemy is such that fire directed against the line, on its appearance, cannot instantly be murderous. It is desired to advance that firing line to a position beyond the obstacle, on the original "bearing." There is

a means of passing to the front, say, on the left of the line as now formed, but it is commanded by the enemy's fire. So far as our Drill-Book now carries us, the firing line would need to first close on the left and then, turning in that direction, march in quick or double time, and, having passed the defile, "form" to the front and once more "extend" from the left. It is needless to say that no sensible man would do such a thing under fire. He would explain what he wanted done, and having explained it, order his men to double, man by man, commencing from the left, and on arrival at the other side to reform their single rank, successively, as they reached their places on the new position. But would it not greatly assist matters if the officer needed only to indicate the position to which he desired to advance, and then give the order "man by man advance"? Practised previously at drill, the procedure would be as follows:—The commander of the section nearest to the defile would give the executive order and *lead* his men in single file, at the double, to the position in front, and, as soon as all had reached it, would re-open fire. The remaining sections would follow in succession, and as each reformed beyond the obstacle, would similarly resume the fire. The officer commanding, as soon as his last section had started, would then follow to superintend the further proceedings. With fairly well drilled soldiers such evolutions are easily learned, and in the battle the fact of moving loosely and quickly enables them to be completed before the enemy can get the range sufficiently well to do any great mischief.

I shall now take another example, and the evolution suggested is perhaps a more generally useful one. A force is about to rush a bridge or other defile. It would usually be desirable that the company first to reach the other side should instantly extend the whole of its strength as soon as it had advanced far enough to give room for the others that follow it. It would involve loss of time, and, moreover, would not generally be desirable to extend from a flank.

My idea of the proper procedure is as follows:—Before starting off, the captain would indicate to the leading section the position upon which they should extend on reaching it, or else tell them to advance, say 50 yards, beyond the exit of the defile, and then extend. The remaining sections, as they arrived, would prolong the line to the right and left, just as a battalion deploys outwards, one company to the right. The result will be to dispose the company as if it had extended from the centre, except that the sections of the leading half company will perhaps stand in inverted order, and that one or other half company will have changed ranks. Such irregularities may be objected to by some, but in my opinion the need for a speedy deployment into single rank, with the centre of the company opposite to the defile, is of greater importance than any respect for conventionalities.

I do not see any difficulty in the way of the foregoing movement, except such as would be common to all formations utilised for the same purpose. It requires three or four rehearsals, and that is all.

Just one more example before we proceed further. I believe that the most useful of all expedients, and one that must often be found

extremely valuable at a pinch, is the total break up of the company, in order to form at top speed upon some named line of defence. The single word *Rally*, following the instructions where to go, is all that is required. For example: "On that ditch in front," or, "Behind that bank over there to our left," *Rally*. To do such things well, demands only that the men shall have had plenty of practice in finding quickly their own places in the ranks. I have never found any difficulty about such matters, and have frequently practised the *Rally* with recruits at the depôt.

Further on in my lecture I propose to give my suggestions for the drill-details of a certain number of battle-drill evolutions that seem likely, in my opinion, to be useful to company commanders. Many other methods, for arriving at similar results, will no doubt occur to various officers; but this fact does not affect the question at issue. My contention is that company battle-drill should include a considerable variety of rough-and-ready expedients, calculated to enable a fighting front to be shown with the least possible delay in the required direction. So long as the company has been so educated that it can readily meet a particular exigency, it is, perhaps, of secondary importance to consider how the desired end may be reached. Yet, I think that, granting the expediency of a more extended battle-drill, it would be advantageous that the procedure, under certain given conditions, should be laid down by authority; because, otherwise, no officer could efficiently conduct such evolutions except with his own men. Uniformity, to a certain extent, is an aid that cannot be lightly set aside. By all means let us encourage the initiative of individual officers, but these will generally find ample scope for their talents when dealing with situations for which no provision has previously been made. Nor would I for one moment suggest that an officer is necessarily wrong because he elects to do this or that in his own way. The result of what he does will afford the only positive proof of his wisdom or otherwise. My object is merely to draw attention to certain possible requirements and to suggest methods for meeting them. It will, I think, be admitted that it is easier to execute an evolution that is already familiar to all ranks, than to attempt a fresh one improvised upon the spot. Moreover, when the companies of a battalion are moved by separate routes to various points, with a view to coming into action on arrival, it would obviously be a cause of satisfaction to the commanding officer to be sure that all and everyone of them are capable of dealing with a reasonable variety of awkward contingencies that may possibly interfere with their rapid entrance into the places assigned to them in the line of battle. A certain confidence in the ready initiative of his company officers to meet exceptional difficulties, will not prevent the commanding officer from congratulating himself upon their acquaintance with a reasonable stock of ready-made evolutions suitable to meet ordinary complications. If the companies are well trained the battalions will consequently be efficient, if fairly well commanded. The real difficulty that now opposes itself to the commanding officer is not so much what to do, in a general sense, as how to get it done. The commanding officer ought not to be hampered by the waste of time involved in giving

explanations, except as regards the tactical aspect of the task in hand. A company officer should need only to be told his place and business in the line of battle. He should be able to reach his place and act as required therein, without being told how to do so.

Similarly in the case of larger bodies, such as brigades, something can be done to shorten the explanations of procedure by adopting a few well-selected words of command that shall in themselves suffice to initiate certain preliminary dispositions. For example: A very simple expedient has recently been tried at Aldershot, by the use of which the mere detailing of battalions to their several duties, and the words "Preparatory Formation," facing, say, south-west, is sufficient to dissolve the brigade into an extremely mobile formation, capable of traversing the roughest ground and even of changing front at a considerable angle, and this notwithstanding the fact that the companies are ready at any moment to assume extended order, should need arise. Briefly, the *modus operandi* is to form lines of companies, half companies, or sections advancing in fours at the requisite deploying intervals. One obvious advantage gained by this system is the readiness with which the whole or portions of any line can close, like a concertina, in order to pass defiles or avoid high ground, and subsequently open once more to the original intervals. There is no savour of "normal attack" about this; it is simply a battle-drill, and its use is to expedite the assumption of a fighting formation in the required direction. There is no attempt to dictate to commanders of units what should be done, afterwards, in the battle itself. They are merely assisted, by familiarity with a system, to get into their allotted places in a mobile formation.

During actual fighting we must, as a rule, depend for order and regularity upon the drill of the minor units, and trust to their working harmoniously for the common good. But there is one exception. I think we might have a drill for the formation of columns of assault. For example: A battalion in column or quarter-column should need only the command *Form Column of Assault* (or by double companies), when each company or double company should extend to single rank from the centre, or from right or left, as ordered. Similarly a brigade in line of columns could be ordered to "Form Column of Assault" on the —— Battalion; or in case of a mass, "Deploy into Column of Assault." I have ventured to take for granted that the best formation of a column of assault is with the battalions composing it placed side by side, so as to form the required number of "waves" with companies of the same battalion following each other. Supposing three battalions to be available for the column of assault, and that a front of three companies, in single rank, will suffice to fill the requisite frontage, then we should have in that brigade eight "waves," each consisting of three companies, in single rank, or say about 300 paces of frontage. Or if a wider frontage, say four companies, were required, then the brigade order of formation might be *Column of Assault on the —— Battalion*; *——Battalion by Double Companies*. In this case, two battalions would furnish eight "waves" of one company each, and the third battalion four "waves" of

two companies each. In the foregoing examples it is assumed that the brigade consists of four battalions, and that one of these is employed in the "first line." I shall now recur to the subject of company battle-drill, and detail briefly the various evolutions that should, in my opinion, be practised at "field training," and subsequently utilised by battalion commanders, directly or indirectly, in order to get their battalions into first line fighting formations, in any direction, in the shortest possible time. The movements are simple in all cases—complicated manœuvres are impracticable under fire, and are, therefore, unspeakable "Turks." My "Turks" are, I venture to think, practicable, and therefore perhaps useful. Any that need further explanation, I shall be very glad to show upon the blackboard.

1. A company, moving in fours, forming at once to the front, into single rank, or into a wider order of extension. Command: *Company* (—— half company or —— section), *single rank, front form*—"*at the double*" assumed, unless otherwise ordered.

2. A company, in fours, as above, forming into extended order, *right* or *left*, or *obliquely*. Command: *Single rank* or *at* —— *paces* (kneeling or lying down), *right* (or left, etc.) *form*. If no other order is given, the file of formation will turn in the required direction, halt, and stand at ease; the remainder moving in quick time or at the double as may be ordered.

3. A company, in line or column, extending the named proportion of its strength to the right or left, or obliquely. Command: —— *Half company* or —— *section, single rank* (or *at* —— *paces*), *right* (or *half right, etc.*) *form*. This is provided for in the drill of a section—Part I., Sec. 48, 4, Infantry Drill.

4. A portion of a firing line, moving to a flank, in order to avoid an obstacle, *in fire-swept zone*. Command: —— *Half company* or —— *section, man by man, to the right* (or *left*) *prolong*. This evolution is nearly equivalent to what is known in the cavalry as a formation "to the outer flank," executed by men in single file. In the case of an infantry firing line the result is a "change ranks." The object of so acting is, that whilst in the case of a simple "*right* (or *left*) *turn double*," the leader would probably stop before he had gone far enough to leave the whole frontage of the unit behind him, each man would, by the method suggested, have only to go one pace further than a man already in position, and the enemy's fire would, therefore, be less likely to halt him before he reached his proper place.

5. A company, under cover, prevented from advancing further, directly to the front, in consequence of an obstacle, impassable except by a defile, say, a foot bridge over a deep

ditch or stream. Command (after naming position to be reached): "—— *Half company* (or —— *section*), *man by man, advance*" (or *rush*).

6. A company in fours, right in front, forming a named portion of its strength into extended order, *to the right*. Command: —— *Half company* (or —— *section*) *change ranks, single rank* (or *at* —— *paces*) *front form.*

7. A company, or lesser unit, in any formation, suddenly required to change position, in the shortest possible time, in order to show a fighting front wherever desired. Command: *Company* (——half company or —— section) *on that ditch in front,* or *on that* —— *to the* —— *rally.* The unit or units concerned break off and double as fast as they can on to the named alignment; every man to be in his proper place on arrival, in single rank or more extended formation, as ordered.

8. A company that has got into disorder, re-organising behind convenient cover. Command: *Company re-organise.* Section commanders place themselves in order, 1, 2, 3, 4, along the line, and when they are in position, captain sounds whistle and gives the signal *Assemble.*[1] Men not already in proper sections change position, covered whilst doing so (if necessary) by the independent fire of those already in their proper places.

The foregoing are some battle-drill movements that I venture to suggest. If all companies in a battalion were fully competent to execute them, the battalion commander could depend upon them for the purpose of getting the battalion itself into position. Some of them would seem to be especially useful to a battalion in case of being required to adopt a fighting formation suddenly from column of route.

If you will kindly bear with me for a little longer, I should like to add a few remarks of a more general nature.

I think that, by means of drill, you can establish a confirmed habit of doing this or that in fairly correct fashion, in accordance with orders, and that a good deal can thus be done towards strengthening the moral element in all tactical emergencies. Even if men were perfectly calm, it is not easy to make them understand what you want in the din of battle. The officer may have conceived a really brilliant idea, wholly deserving of success, and yet the manœuvre may be rendered useless because what was required has not been properly understood. Yet he cannot hope to have a ready-made plan of action suitable to every possible contingency, and even if such were possible it would be very wrong to insist upon the Drill-Book method being rigorously observed. What is really needed is that officers in command shall quickly realise what they want to do, and if, in addition, such initiative is aided by a ready comprehension of how best

[1] *Not in Drill-Book. Arms raised above the head, hands lowered, knuckles together, till points of fingers touch the cap.*

to do it, by the aid of the Drill-Book or otherwise, so much the better. In short, any battle-drill that could be devised must be regarded solely as an auxiliary to the intelligence of the individual officer, and intended simply to save the time and uncertainty involved by explaining methods of procedure. The officers on the spot must judge whether to utilise ready-made evolutions or to invent others.

One thing that must under all circumstances be borne in mind is the importance of keeping the possible influence of the moral element always in remembrance. What you want to do is to get as much fight out of all your men as if they were all heroes, and you cannot depend for this upon the idea that the heroes will press on and that the others will follow; this if it takes place, to commence with, cannot last, for the heroes will get knocked over, and the others will then cease to advance. In an actual assault you can perhaps rely upon excitement, aided by heroic example, carrying forward the whole column with irresistible force; but when under more or less effective fire, at some distance, and no assault is in progress, the nerve trials inducing a tendency to shirking are far greater. It is for this latter that we need to legislate so well as we can. If the containing line succeeds in establishing and maintaining itself in grips with the enemy, it thereby foreshadows the success of the assault that follows. Therefore, the fortunes of the containing line are of the first importance, and no stone must be left unturned that can possibly exercise a favourable influence upon them. I think that during the advance of the containing line, from first to last, there will certainly be many occasions when companies would be assisted by the use of some additional drill formations, such as I have already suggested. Some of these formations are merely expedients calculated to show a front in the required direction in the least possible space of time, but others, I think, possess a still greater value by providing for moral as well as tactical considerations.

For example, when a company prolongs, man by man, to a flank, or advances, man by man, to the front, an illustration of my meaning is, I think, presented. The first few men will probably reach their new positions before the enemy can do much damage, and as soon as a section has reached its place it can open fire, thus, to some extent, distracting the enemy, and at the same time encouraging, by the noise, those men who have still to come up. Each man as he comes has only to go one pace further than the man who arrived before him, and, moreover, he can see clearly how far he has to go. This assists him to brave the danger. But if, upon the other hand, such a formation were to be attempted by making the man who had the greatest distance to go lead the way instead of following his leader, the probability is that the required distance would seldom be covered—and, besides, no fire could be opened until the very last man had reached his place. The method that I have suggested seems preferable, tactically as well as morally. In conclusion, I would venture to repeat that, in my opinion, success in modern war will depend upon good drill, just as much as ever it did in the days of old. We want drill in order to enable the minor units to get

into their places, and we want it also in order to husband the moral element at all times. The value of drill will always become especially apparent at the most critical moments, by expediting manœuvres or giving men something else to think about besides the danger. An assaulting column, for example, should always form up with just the same regularity that would be required before a march past, and the advance should be made strictly at attention. The force of habit is a most valuable auxiliary, and should invariably be made the most of. There is practically no limit to the influence that habit can exert, no matter how exceptional the circumstances. I have never forgotten an incident that occurred in my company of the Army Service Corps at Suakin, in 1885. We were in the middle of the fight at McNeil's Zeriba, commonly called Tofrek. My trumpeter had a rather nasty mare that used to buck, and when things were at their worst she threw the boy over her head, charged through the Marines, and went off into the desert. The trumpeter landed on his hands and knees, where he remained for some moments gazing after the retreating form of his mount. Then, seeing a sergeant of the company a few yards off, he called to him:—"Sergeant! sergeant! shall I be up to office to-morrow morning over that there horse?" Half-a-dozen yards behind him a free fight was going on, but he forgot all when he considered the awful possibility of staining a clean defaulter-sheet! That boy is now a company sergeant-major, and will probably rise higher.

We may depend upon it that there is nothing like the habit of routine, or discipline—call it which you please—to overcome men's natural fears, simply by distracting their attention from the particular danger that for the moment assails them.

Major-General A. B. TULLOCH, C.B., C.M.G., *p.s.c.*:—Mr. Chairman, I rise to suggest that the younger officers should have led off with the discussion, but perhaps the lecturer will not object to some of the older ones who are now out of it saying something. Like the sign posts on a road, they may point out the way which they are now unable to go themselves. This lecture was advertised as being on the "Battle Training of Infantry." I hope the lecturer will not consider me hypercritical in saying that I wish he had given us one or two ideas on rather more subjects than that of a company—what is called the practical training of a company; because I venture to think that the lecturer does not go much beyond company training, except in one special point, and that is, what is known amongst the young fellows in Aldershot as the worm formation of attack. That worm formation of advancing in files from the right or left flank of a company or section is, no doubt, an excellent idea; it is one of the best things that has ever been brought forward; the only objection I can possibly see to it is this: that a column at distant ranges is more liable to be struck than a line. Now, the question of Battle Training has been with me a subject in which I have taken a very great interest, not only as an officer commanding a regiment, but as a brigadier, and afterwards in the command and organisation of a very considerable body of troops in Australia. Some ten years ago, at the present Commander-in-Chief's request, I gave a lecture in the old Institution on Battle Training, and I am glad to say that most of the suggestions were taken up; but one of the points especially brought forward and which is now in the Queen's Regulations, namely, the instruction of young officers—I mean their personal instruction by the commanding officers—I do not think is carried out to

the extent to which it might be. I may mention that when commanding a battalion I took the greatest possible interest in instructing the young officers, precisely as an instructor at Sandhurst would do it. For instance, we would have an attack on a bridge, an attack on a house, defence of a position, and so forth. I used to give the subject out some days before the thing took place, and all the subalterns used to go out and give me their ideas in a regular form of report and sketch. Everyone of those reports and sketches I criticised myself and wrote my remarks on. Afterwards we went out with the battalion and made the attack, without firing, and the third time we did it with blank cartridges. The interest the young fellows took in it was amazing. I believe that all those young fellows who had been trained at Sandhurst were head and shoulders above others trained, or rather I should say *un*trained, elsewhere. The practical knowledge they showed with reference to attacking places and out-post work, and things of that kind, was delightful to see. Nothing could be better than to see the power they had of showing what they were made of. I have made notes of one or two things, and I hope I shall not be considered as taking up too much of your time. Not only were the subalterns trained, but the non-commissioned officers also. I used to have the whole of the non-commissioned officers up in the schoolroom, after any specially big field-day, and with the blackboard explain all the mistakes that had been made, and tried to get the non-commissioned officers to ask me questions. The sergeant-major as an encouragement usually led off, and it was really startling to find how well those non-commissioned officers understood their work. So much for the training of officers and non-commissioned officers. I think now that we do not *train* the men sufficiently in what is called battle firing —not merely field firing, but systematic instruction in battle firing at unknown distances. By present regulations a G.O.C. can sanction 40 rounds per annum for field firing. This miserable little amount only serves to show how very badly our men fire at unknown ranges. In South Africa, while I was there I managed to get a special allowance of ten rounds per man a week, and if we could do that in this country, or any other part of the world, it would be well. I managed also to get additional ammunition besides the ten rounds, and the men also spent a considerable amount in purchasing ammunition for private club firing matches at the fixed ranges. The whole battalion became such excellent shots that the Boers and colonists in Natal were absolutely nowhere. When firing against us at unknown ranges I found that every man (with the exception of about five per cent. whose eyesight was bad) in the regiment could be made a good shot. In Australia I adopted battle firing, and I also extended it to the Field Artillery. If we ever had a big war, I am sure that a large contingent of Australians would come over, and the effect of the battle firing in which they have been trained will be startling in the next big action we may have. Another point we ought to train our men to is advancing firing in line. As everyone knows, at the end of the business the men push to the front, firing at the same time. I think that that procedure ought to be systematised. I have tried it with blank cartridge and afterwards with ball, and I have found that the shooting was very fair indeed, even when the men were pushing on at a good marching pace. They did not stop, but simply threw up the rifle, stopped for half a second to fire, and pushed on again. Then comes the question of our present eight-company organisation. I think that the present company is too small, and that we ought in fact, if possible, to try and have double companies, or rather a four-company organisation. What I used to do was to make two companies always work together, the second company to act as the reserve of the one which happened to be in front; but I think we might go further than that, and take the double company formation. Nor do I think that we make as much use of the ground we have, even in this country, as we might. In Ireland I found we could always get ground by going to the farmers and explaining what we wanted. I used to go round to the different farmers and say, "We are going to have a game of

landlord and tenant: the tenants will be behind the hedges, and by and by the landlords will come along and we are going to give them snuff." They all fell into it, and I never had any difficulty in getting what land I wanted. There are some places, like Malta, where you cannot possibly get good battle training; but we hope by and by that our good friend the Navy will take over Malta altogether, and then we shall be relieved of the hopeless attempt of trying to properly train soldiers there. In the meantime, no regiment ought to be kept there more than two years. As I mentioned, the farmers are very good. The only people I ever found give any trouble were the people who preserve large quantities of game for the London market. It is all very well to say that the farmers would object to our working across country, but the owners of certain estates are the only people in this country and in Scotland who really give any trouble. In conclusion, I have to thank the lecturer very much for the address he has given us, and I hope we shall hear more of that training of which I have spoken.

Major H. H. L. MALCOLM (2nd Bn. the Queen's Own Cameron Highlanders):—It seems to me that this lecture discusses rather an important branch of drill. It touches the words of command, especially those which are given during a battle, when the giver of the command is much excited, and the men under him are equally so. It is very important that the words used at such a time should be well chosen and thoroughly well rehearsed beforehand. Now, the words that are given here by Major Pollock seem to me unsuitable in many ways; but on turning to the Drill-Book—I think it is Section 216—we have words which have been in the Drill-Book as long as I can remember, for 20 years. Those are in the "Shelter Trench Exercises," and I think that the principle employed there covers nearly all the movements Major Pollock has given us in his lecture. The formation is: from file, forming to the right at two paces interval; so that we there have the forming at an interval which is one of the principal features of Major Pollock's suggestions. I think that the words of command there given should be adhered to as much as possible, because that is what everybody has been accustomed to for many years, and it is very necessary to adhere to what people know thoroughly. Those words of command are applicable to most of the examples Major Pollock has given. For instance, in movement No. 1—taking Section 216 as a type—the words would be "To single rank, front form," which are very much what Major Pollock has. The next, No. 2, would be "To single rank, right (or half-right) form," if necessary of course giving the number of paces. If you are moving to the right, and want to form to the left, it would be a simple matter; first giving the words "Change ranks," then "To single rank, left form"; which would be a very simple form which everybody would know, without any special explanation or special training. These words of course are not properly applicable to extended order drill at present, but they might easily be made so; it is simply adhering to the old form of words which everybody is accustomed to. No. 3 is exactly the same. Major Pollock's word of command would be simply "To single rank, right form," or "Half-right form." With regard to No. 6, it would be simply "Change ranks" to "Single rank, front form." There are other points of the lecture to which I should like to refer, and the first is where Major Pollock makes the suggestion "Behind the bank, rally"; "rally" being given as a suitable word for moving quickly from one place to another at any sort of angle, so as not to have to "form" and "advance." I do not like the word "rally," it sounds as if the troops were in confusion and had to rally. I think that the word "double" would be very much more suitable. If one said "Behind the bank, double," it would come to the same thing. Then further on in the paper there are the words "Form column of assault." That appears to be for a brigade movement. In brigade drill most of the commands are left entirely to the brigadier, so that it seems rather unnecessary to lay down that one. But it appears to amount to extending

to single rank by companies, which is a very simple way of describing it, and does not involve any new sort of word of command; so, "Extend to single rank by companies," I think would do very well there. There are several other movements which do not come under the principle of Section 216. In No. 4 Major Pollock gives the words, "Half company, man by man to the right, prolong." Well, that seems to me rather a complicated and novel word of command. I think we should arrive at the same thing by saying "Right turn," "Change ranks," "Left form," giving the words "Change ranks," instead of suppressing them. Then with regard to No. 8 of his suggestions, he says "Company re-organise." The intention seems to be to call out the section commanders. I think it would be very simple to call "Section commander," just as one calls for "Left markers." I think that would answer the purpose just as well. I do not wish it to look as if I did not appreciate the lecture by making these remarks, because I think it is a very good lecture. I am simply trying to point out what changes I think might be made in the proposed words of command. One instance occurs to me, when I have sometimes wanted a word of command very much, that is, in firing round a building or at a turn of the road with a small section; the section being under cover one gives the words of command, "Front form, double," and then "Volleys," etc. Then one wants to get the section back under cover quickly, and I think one *does* rather miss a word of command there. There is no mode of forming back, and one does not want to turn one's back on the enemy before forming under cover.

General Sir WILLIAM GORDON CAMERON, K.C.B.:—I had no intention of speaking now, Sir, having understood you intended calling on the younger officers first, of whom so many are around me well able to give an opinion. I thought it therefore better to wait for some remarks from them. As regards myself, I came here expecting to listen to something more descriptive of the general attack (the whole subject), but hardly feel prepared to consider merely what the company has to do and the introduction of certain new words of command. I quite admit, and always have admitted, that the company exercises are the great foundation for everything that we do on the battle-field, and therefore I think we are very much indebted to the lecturer for having given us his views on company drill and exercises in extended order. I used to attend from three to four times during the annual course of military training for the companies of the several regiments under my command, and as far as my experience goes we were enabled, working according to the present Drill-Book (I do not think it has undergone any material alterations since my time, about three years ago), to do nearly everything that has been explained, with plenty of practice. It is very much what the Swiss do. Their recruits are taught during their first three or four months' service to be so handy in extended order movements that at last they require hardly more than a mere indication to move in any required direction or take up any position which is pointed out to them. It was pointed out I think the other day in Colonel Hutton's lecture at Aldershot, that what struck everybody most at the German manœuvres was that one hardly heard any words of command. The men had been so thoroughly practised that on the mere signal of the commander they at once grasped the idea and did what was required of them. That of course requires very considerable training and thorough mutual understanding between all ranks, and we must endeavour to arrive at all this. For myself I think that during the twenty days set apart now for companies to go through the annual course nearly the whole of that time ought to be devoted to extended order drill and minor tactical exercises. Much can be done on the barrack square or drill field, a fairly large one of course. Take the ground at Shorncliffe, how much useful practice may be obtained by placing in any selected position a skeleton enemy, with a musketry instructor, if you like, to spot all unnecessary exposure, and tell you what the effects of the fire would have been from the position. Attack that position in all sorts of ways. Say we will attack it on the right, covered by

the left, trying always at the end of the assault to bring up all the units (sections or whatever they may be) without losing their order more than is absolutely necessary. Then attack the position on the left, covering yourself with your right. Then attack the centre covered by the fire from both flanks up to the very last moment when the assault is delivered. With a number of exercises of that sort you get your men very handy at every sort of attack practice. After a certain time, I used to expect the troops to be nearly perfect in all those movements. Changes of front ought to be done as quickly as possible without unnecessary words of command. You have only to point out the line to them, and away they go, every man by the shortest line. If it is a change of front under fire, every man throws himself down directly he reaches his position, and opens fire. And when the change of front is completed, the fire becomes general. All those things, I think I am right in saying so, at least I have always found so, can be carried out pretty well with our present Drill-Book. There is a habit, I think, in our Service of finding fault with our tools a good deal. I hope the Chairman will be able to corroborate my statement that you can do a great deal with the Drill-Book as it stands if interpreted in an intelligent manner. If every company tries to make the very best of the Drill-Book, and the men are more highly instructed how to apply all it contains, then I think that with the necessary amount of practice they can be made under the present system fairly ready for the battle-field. But under a system of Voluntary Service, which involves what is called "popularising the Army," I am afraid we cannot expect the same continuous hard work which is considered necessary in Continental Armies to make a thoroughly trained soldier within a reasonable time. This I have been frequently told would prejudice recruiting. With regard to what Major-General Tulloch said about the young fellows who come from Sandhurst being so very superior and knowing everything when they join – well, I cannot say that my experience quite tallies with his, quite as far, I mean. I used when inspecting a regiment to be in the habit of inspecting it company by company, calling all the officers out and seeing exactly what they knew on every single subject in connection with their profession; and it always struck me that, as regards tactical education, there is very little done at Sandhurst practically. I do not think they go much beyond the ordinary drill for a private soldier. I do not think that the Cadets at Sandhurst are instructed in out-door tactical exercises as I think they might be, and as they are, I believe, at some of the military colleges abroad. They generally become what are called Recruit Officers for several months, and they have to go through everything, I think, from the very beginning, just as if they had had no preliminary work at Sandhurst. With regard to the subject of field-firing which has been referred to, of course that is one of the chief things that we have to practise. I do not think there is any want of ammunition, I always found I could get it in South Africa.

Major-General TULLOCH:—Yes, in South Africa.

General Sir WILLIAM GORDON CAMERON:—But I can appreciate in England 40 rounds a man. Those exercises are left to the discretion of the General Officer; and if the General Officer chooses to say he thinks field-firing is of vital importance, then I think under the present regulations he will be able to devote about 40 rounds per man to field-firing where ground is available.

Major-General TULLOCH:—I used to have ten to fifteen rounds once a week.

General Sir WILLIAM GORDON CAMERON:—If you could get forty rounds per man for the colonial troops in Australia so much the better. I quite agree that field-firing is the most important thing there is, but it should be done gradually. You have to commence with sectional field-firing. When each individual man is thoroughly trained, then you go on to company, battalion, and brigade field-firing. In South Africa every company went out separately for

field-firing, sometimes lasting six or seven hours. We did not wait to check targets until the whole practice was over, as is done in our field-firing at home, but took off the hits at the end of each stage so as to be able to clearly point out to the men where their fire had been good, bad, or indifferent, and how it might have been more effective. Otherwise everything is hurried through, and there is generally a tremendous amount of firing at the very shortest ranges in order to swell the aggregate score—not a difficult matter under these circumstances, but a doubtful test of the men's shooting powers on unknown ground and unknown distances.

Colonel J. WHITTON (late Royal Scots Fusiliers):—I came here to-day, Sir, but I did not intend speaking, as I have not had time to study these matters thoroughly, and I therefore wish simply to make a few remarks on Major Pollock's suggestion. I think the best way I can do it is by saying that I commanded a regiment four years, and I will tell you how I did it, and the points that occurred to me as making for Major Pollock's proposal or otherwise. My command was in India, and I used, on the commanding officer's parade, to march the regiment straight from the ground on which they paraded and begin my manœuvres, that is to say, the practice of the drill, from the moment I started off. If a tree was in the way, somebody had to move out of the way of it; if a building was in the way, it had to be negotiated by the men without my interference with them. That was their business. I went straight out as far as I required to go, utilising the ground, or rather suiting my manœuvres to the formation of the ground. I expected on these occasions that every officer should manage his company properly and every non-commissioned officer his smaller command. When I had gone as far as I required in the way of manœuvres, or as far as the time available allowed, I simply rested a few minutes and came back again in somewhat the same way, and during the whole morning's work firing was constantly going on, that is to say, the enemy was supposed to be in front of us. He was attacked according to his strength. I supposed him to be to the right, and to be to the left, and in different directions, and I suited my manœuvres to that, and at once had the men brought to action—as Major Pollock contemplated when he wrote out this lecture. I have merely to say this, that my experience leads me to believe, with Major Pollock, that certain other things are necessary for the Drill-Book to make it perfect. Our Chairman will be able to give very much more valuable information than I can, for he is still in harness, while I am not; but that is the result of my experience, that certain modifications in the Drill-Book would be advisable both in drill and in firing. I will not detain you, gentlemen, any longer, because I trust I have made clear what I meant. I rather agree with the lecturer that some changes would be an improvement.

Major POLLOCK, in reply, said:—Before I reply particularly to what has been said by each of the gentlemen who have so kindly spoken, I would like to make a few general observations. What I had in view when writing my lecture was to suggest my subject as briefly as possible, and trust to having the whole thing thoroughly thrashed out during the discussion. I am sorry that the discussion has not taken the line that I hoped. Colonel Whitton indeed gave us his opinion upon the question at issue, but as his views agreed with mine I am afraid that I ought not to quote him. My opinion is this:—1. We either want more battle-drill or we do not. 2. Companies either do or do not get into situations with which the ordinary procedure of the Drill-Book is powerless to deal—unless after much explanation and many words of command. Whether the methods that I have suggested are good or bad does not matter twopence. Let me recall to your minds my own words upon this latter point:—"Many other methods, for arriving at similar results, will no doubt occur to various officers; but this fact does not affect the question at issue. My contention is that company battle-drill should include a considerable variety of rough-and-ready expedients,

calculated to enable a fighting front to be shown with the least possible delay in the required direction." Well, if the Drill-Book already provides all the necessary expedients for getting a company in any sort of position or formation you please, into other positions or formations that you happen to want at the time, then, of course, my lecture was uncalled for. But in my humble judgment, there are not, in the present Drill-Book, nor have there ever been in the Drill-Books that have preceded it, any movements calculated to help a company officer who finds himself in a tight place. Take that very thing that I was speaking of a little time ago—marching a company in fours through a defile and extending beyond. Is there anything in the Drill-Book which will get that company, at once, into extended order on commencing to debouch? There is nothing. You would have to march clean out (according to the Drill-Book), and then, having got your distance, front form and from the right, centre, or left, extend. That, I think, is as far as the Drill-Book takes you. I may be wrong. General Tulloch complains that I have not gone in for so large a subject as he expected. Well, I am afraid that there has been a misapprehension. You will see that the lecture is superscribed "Battle Drill," but has been advertised as "Battle Training." I originally used the latter words, when suggesting myself as a lecturer, and fear that I neglected to have them altered to "Battle Drill," which is a much more suitable title. But even thus, I think that if you have got good company "Battle Training," you have got (with the exception of what the superior officers have to learn) battalion training, and brigade training, and every other sort of training. If the general commanding an army corps can make up his mind where he wants his divisions to go, and what he wants them to do when they get there, he has only to give his orders and leave to those concerned the duty of executing them. The troops accordingly march off, and that is so much done. Orders and responsibilities travel down the scale of command until the lieutenant-colonel of a battalion comes to detail, say, four companies to be disposed as a fighting line, we will say, between a tree over here and a stream over there. There may or may not be obstacles in the way that must be passed in order to reach the intended alignment. Colonel Whitton has told us how he used to march his battalion across the plains in India and how the companies had to negotiate such obstacles as they met with as best they could. One was obliged to move to the right to get out of the way of this, or another had to climb over that. Before they started he told the companies where to go and what to attempt, and he expected those companies to obey as best they could. They had their instructions as to what their task was to be, and it was their business to perform it. Now what I have been endeavouring to provide for is that each company shall be able to get into its place, and show a fighting front therein without difficulty or delay. There is really little else in manœuvre drill that is worth thinking about from a fighting point of view. The rest depends on having superior officers knowing what they want done and leaving it to captains of companies and commanders of sections to get the men into the places where they are required. To have loose drill and still have the men tight in hand—that is what you want training for. You do not want men to be thinking and wondering and not understanding what you are saying, while you are "explaining" what you want. If you have got drummed into them the meaning of a certain word of command, then you have only to "jump" it at them, and they will obey it whether they like it or not. Major Malcolm took some pains to show that there is no novelty in anything that I have said. I do not know whether there is or not, but I should be very glad to think there is none whatever. He brings in the shelter trench drill as an existing and preferable method for doing the movement suggested by me for "prolonging" to a flank. I rather think that there are less words used in "man by man to the left—or right—prolong," than in the business of forming on to a trace line, because there I think that you have first to tell the men to turn, then to wheel, then to wheel again, and finally to "right or left

form in extended order." I think that is it. I know there are about fourteen words of command before you get them at two paces interval.

Major MALCOLM :—I only took sufficient words to represent your meaning—I did not take the whole of them.

Major POLLOCK :—Perhaps I did not understand you. I have already stated that I do not care in the least what word of command is used, provided that the movement itself is executed. There are hundreds of people who have probably thought of the same or better things already, and who could suggest what I had hoped to get out of this discussion, viz., something that we could all perhaps agree about. What I wanted to get at was, first, to decide whether all or any of my propositions are worth giving effect to; and then, granting that any of them are worth the trouble, how effect is to be given to them; in the way suggested, or by some other means. I venture to think that the one exceptional situation that the Drill-Book actually provides for, which is a company or section marching in line—and requiring to extend suddenly in an oblique direction—that if they were so marching, and you gave the command, "Single rank, half right extend," I do not believe that one-half the companies in the British Army would know how to do it. I do not believe that 20 per cent. have ever tried it. Perhaps I am wrong in this also—I do not know. This is only one single instance, and I should like to think that there is no novelty in it. I should like to imagine that every company in the British Army had done this and every one of those other things that I have suggested every day during the last twenty years. With regard to Major Malcolm's objection to the word "Rally," I selected it simply because it is the cavalry word used to reform after a charge, and exists already. Some other word might do just as well. Sir William Cameron and General Tulloch spoke of a very important branch of battle-training, which is field-firing. If we could only get field-firing done so that it would be a reality, it would be most valuable. We know how the Boers became good shots; it was because they were always shooting game at unknown distances. We know that the British soldier very often beat the Boer, shooting at a gin bottle on an ant-heap, at, say, 100 yards. I have done it myself. *Now* the Boers are no better shots than we are, simply because there is no more game for them to practice at. In field-firing we need, I think, to divide our men into two classes; men who are worth sending to field-firing, and men who are not. It is pure waste of ammunition to take out a man who is not a reasonably good shot and set him to field-firing. If the bad shot has so many rounds to fire, it is far better to let him shoot at a range target and learn to hit it. This done, *then* let him go and fire at unknown distances. The new Musketry Book—although I have not yet seen it—I believe provides for this. A very valuable point, brought forward by Sir William Cameron, is how to make the barrack square available for tactical training. I am sure you can do much if you divide your training into drill training and manœuvre training. For instance, you can do a most valuable outpost exercise on the barrack square, to teach young soldiers, because you bring the whole thing under their eyes. They can see the pickets, groups and sentries, sentries standing up and groups lying down, and can see the visiting patrols go out, touch the picket on the right or left, go along the rear of its own groups, touch the picket on the other flank, and then return. They can see the reconnoitring patrols sent out, and see them return, between the same sentry posts, back to their picket. They can see a prisoner taken and blindfolded, marched up to the officer commanding the picket, and then marched to some imaginary officer commanding outposts in the rear. Then, when you bring them out for outpost exercises on the ground, it should not be to teach them what to do, but to show them how to apply what they have already learnt. I think all the minutiæ of outpost duty should be gone through on the barrack square, not even going out to the drill-field, because a certain amount of time is wasted in going out and back again. I am afraid that I have myself wandered rather off the real subject, and I much apologise for having talked so long.

The CHAIRMAN (Major-General Bengough):—In making a few remarks on the general subject of this very interesting lecture this afternoon, I will ask your attention first of all to the practical nature of the subject. We have not come here to listen to any high-flown theories, or any elaborate proposals for the re-organisation of the Army (we have had plenty of these), or to a dissertation on strategical studies. It is a simple question apparently of how a company officer is to be helped to lead his men in action when the critical moment comes and he finds himself face to face with the enemy. I have been to many lectures in this Institution and heard many eloquent discourses, but the occasions on which I have gone away and said to myself "I have learnt something to-day which will really be of use to me in my profession as a soldier, whether as a leader of a company or of a battalion or of a brigade," have really been very few. Major Pollock has thoroughly thrashed this question out, and I think we have this evening learnt something that we can make use of in future if we work the subject out. It is impossible here to discuss the details of the principles which Major Pollock has here laid down, but I do distinctly think there is something wanting—I do not say in the direction in which he advocates reform. The Drill-Book may easily be made to apply, but I do not think it does so at present in all cases. I do not think we recognise the question of battle-drill. We have plenty of drill, in fact some of us say we have too much. Do not let me be misunderstood, gentlemen. I do not wish to depreciate the value of what our late honoured commander-in-chief, the Duke of Cambridge, used to call steady drill. Steady drill has most important advantages. It is excellent for field discipline; it is absolutely necessary in moving your men from one parade ground to another—getting, for instance, a certain number of men into Hyde Park and getting them out again. It is necessary for carrying through a successful review. But our present drill, as practised on our parade grounds, is, when applied to the modern field of battle, something like attempting to meet the repeating rifle with the blunderbus or Brown Bess. The thing is out of date. What is the origin of all drill? Let us go back just for a moment to old days—classic days. Take the old Greek phalanx or the Roman legion. Their movements, I imagine, were suitable to the battle-field; so were the lines of Frederick the Great, those great lines with which he manœuvred in front of his enemy and achieved such great successes. They were practised on the parade ground as they were practised in the battle-field. It was the same with Napoleon's columns, and down to the Crimean War. Our line movements, which were in those days so assiduously practised on the parade ground, were exactly the formation used in battle. What is it now? Go on to any parade ground and you will see the same sort of drills practised. There are certain modifications, but the practices you see on the parade ground, as a rule, are in no way calculated to help men fighting on the battle-field. That I think must be evident to us all. With regard to this system of battle-drill, of which I think I may say Major Pollock is the father, I go one better than my friend, and I say, let us have field-drill—that is to say, not only the formation of actual battle, but all field exercises should be practised on the parade ground. I can support what Major Pollock has said about the teaching of outpost duty very strongly from what I have seen myself. The regiment to which Major Pollock belongs was in my brigade at Aldershot. Not long ago the brigade was practising outpost duty. I visited the various sentries, putting questions and getting answers, generally somewhat vague. When I came to the Somersetshire Light Infantry, I said to the first sentry, "What are you?" "Sentry, sir; No. 1 group, No. 2 picket, Somersetshire Light Infantry." And so with all the others. That was the result of the training that Major Pollock has told us was carried out at the depôt. I do not think there are any exceptional facilities for training where that depôt is stationed; but the drill is thoroughly learned. That is a lesson our comrades of the Militia and Volunteers can lay to heart. They

complain of the difficulties they have in finding ground for outpost duties when they come to Aldershot. These men of the Somersetshire Light Infantry came from the barrack square, and they knew more of their work than the regiments which had been in Aldershot for two or three years. I will not take up time now to criticise the details of the scheme. There is one little point which struck me, which, as it involves a principle, I should like to mention. Major Pollock imagined a company advancing what is called right in front in fours, and the enemy suddenly appears on his right flank. He talks about changing ranks. Is that necessary? Why change ranks? Surely you ought not to want any front or rear in the field; the enemy should be the front, and that should be sufficient. "To the right, extend!" that is all you have to say. The idea of changing ranks in the field is wrong. It is only a small matter, but a principle is involved, and that is the reason why I mention it. I mentioned the word "section" just now. It is my opinion that it is to the section we must go for any satisfactory training in field discipline, fire discipline, or whatever you choose to call it. It must eventually rest on the basis of sections—independent sections, but subordinate to the command of the captain. Gentlemen, I hope you will allow me, in conclusion, to make one short personal reference. This particular afternoon is one of great interest to me, inasmuch as it is probably the last appearance of an old soldier in public. I regret to say I am now no longer on the active list. The fatal shadow of the inexorable age warrant has fallen on me—I may say, the shadow of the inexorable death warrant, for, to speak as a soldier, I fear my days of soldiering are over. It is a great pleasure to think that in this last act I have been associated, however humbly, with others in an attempt to make the work of the company leader, the battalion leader, or the brigade leader—the British leader—in action, in any way more easy to him. We know and can trust the capacity of British officers for leading, their courage and their heroism. All we seek is to add that knowledge that will enable them to obtain even greater success in the future than in the past, and at less loss to themselves and with greater loss to the enemy. I am sure you will allow me now to offer our united hearty thanks to Major Pollock for his interesting lecture.

The following is the method of instruction referred to by Major-General Tulloch (late Welch Regiment):—

Detail for Tactical and Special Shooting Instruction (Welch Regiment).

Monday—Field firing.

Thursday—Holiday. Match firing, company clubs.

Friday—All hands parade under C.O.; 15 rounds blank. Attack and defence of position, or advance and rear-guard actions; attackers to be generally about 4 to 1. Company ammunition men and company stretcher men to be exercised once a month on these occasions. The drummer boys to represent wounded men, and a flag to be planted to represent the bandaging place, towards which the boys are to be carried for about 40 or 50 yards. The corporal in charge of the stretcher party will distribute "wound tickets" as may be arranged. Officers and N.C.O.'s commanding sections are at once to fall out on receiving a ticket. The next in seniority to command.

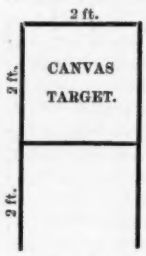
When firing blank, officers are to be most careful that sights are adjusted and aim taken as when field firing.

Range-finder to be taken out once a month on C.O.'s parade, to test accuracy of men giving the distances; the mounted infantry company on such occasions representing Boers, and moving from place to place firing blank.

Monday, Tuesday, and Wednesday, everyone in barracks to turn out for a quarter of an hour before breakfast, "shirt sleeves and rifles," for aiming drill, advancing in line, last stage of attack.

The men so parading to be divided into bodies, advancing and retiring. Every man to aim carefully just below the waist at some other man in the opposite line.

For field firing the second grey flannel shirt is worn instead of a scarlet kersey. In cold weather it is almost equal to the kersey in point of warmth, and in hot weather is very far superior to it for coolness.



Targets for field firing are 2-feet squares of canvas fencing wire.

FIELD FIRING.

With Special Allowance of Ammunition, South Africa.

DETAILED INSTRUCTIONS.

LONG RANGE.

3 targets, 2 feet square each, close together for each squad; centre target to have a white cross. The squad targets should be about 25 yards apart. No assistance in judging distance to be given to squad commanders by officers. Range-finders not to be taken out.

Each squad commander will give the distance to his men in a low tone, so as not to be heard by the other commanders, adding full, fine, or half-sight, as may be necessary, and then in a clear tone and decided voice, "Fire a volley," ready, etc., as usual.

Practice to commence at not less than 700 yards—2 volleys.

Advance to about 600 yards—3 volleys.

Compare Targets.

Advance to about 500 yards—2 volleys.

,, ,, 400 ,, 3 volleys.

Compare Targets.

Advance to about 300 yards—1 volley and 4 rounds independent.

SHORT RANGE—FIELD FIRING.

By squads, as in long range firing. No assistance from officers. One target 2 feet square to each squad. Ten rounds between 400 and 200 yards; distance unknown.

To commence at not less than 400 yards—3 volleys.

Compare Targets.

Advance to about 300 yards, sights down—1 volley and 2 rounds independent.

Compare Targets.

Advance to not less than 200 yards—1 volley and three rounds independent.

SQUADS.

Squads to be nearly as possible equal; irregularities of numbers to be arranged whenever any large batch of men join or leave the regiment.

1st, 2nd, 3rd, and 4th squad commanders of each squad to be brought forward each muster day, or named if they are absent on duty, so that they may be well known to all the squad. The four best shots and two best judges of distance to be named at the same time. The 2nd, 3rd, and 4th squad commanders are occasionally to be exercised in commanding their squads during tactical instruction. This number is provided to meet any possible casualties in action.

In attack formation, with a captain and one subaltern to a company, the subaltern will command the right half-company and the colour-sergeant the left. Should the subaltern become non-effective, then the senior sergeant of the right half-company will take his place. In the same way, should the colour-sergeant become non-effective, the senior sergeant of the left half-company takes his place.

The N.C. officers are not to pass from one squad to others, except in the case of a colour-sergeant, who, as already stated, virtually takes the place of an officer.

In reinforcing the fighting line *the squads are to be kept intact*, the squads of the fighting line always closing in sufficiently to their centres to make room for their reinforcing squads which will fill the gaps. The reinforcing squads will always make for their own half-companies which are in front.

CONTINENTAL REGULATIONS FOR THE TRANSPORT OF SICK AND WOUNDED BY RAIL.

By Surgeon-Captain C. H. MELVILLE, A.M.S.

Introduction.

THE carriage of sick and wounded men by rail is a question the importance of which, to the military no less than to the medical officer, cannot be over-estimated. On the Continent the arrangements for the systematic removal by these means of disabled men from the front to the base of an army in the field are excessively elaborate; fully-equipped hospital trains being kept in readiness in time of peace, stores for the rapid improvisation of others being accumulated in the mobilisation depôts, and instructions issued whereby ordinary trains may without further alteration be utilised for the transport of cases whose condition is not such as to demand special accommodation, or whose removal is a matter of such urgency as not to permit of the delay necessary for the provision of the same. The question does not appear to have received the same amount of attention in our own Service, whether at home or in India; and from my experience but little is known in our Army of the principles which regulate the formation and working of Hospital Trains outside the somewhat limited circle of staff and other specialist officers, whose work has brought them into immediate contact with the subject. It has appeared to me, therefore, that a short consideration and comparison of the Regulations for the Transport of Sick and Wounded by Rail, as laid down in four of the leading Continental Armies (viz., the German, French, Austrian, and Italian) might not be without interest and perhaps instruction.

I have followed the classification of Hospital Trains used in the French Service as far as the names of the three classes go, viz., Permanent Hospital Trains, Improvised Hospital Trains, and Ordinary Trains.

Permanent Hospital Trains.

Synonyms.—German: *Lazareth-Züge.* French: *Trains Sanitaires Permanents.* Austrian: *Eisenbahn-Sanitäts-Züge.* Italian: *Treni Ospedale.*

These trains are in all cases units of a permanent nature. They are composed of carriages specially built, or specially fitted up in a permanent manner for the performance of special functions, *e.g.*, as kitchens, store-rooms, rooms for establishment, carriages for sick, etc. These carriages are arranged in a definite order, which is not allowed to be

interfered with, except under special circumstances. Permanent Hospital Trains are provided with a permanent establishment and equipment, and are intended for the transport of such cases only as demand not only lying-down accommodation, but also more or less constant attention.

The formation and size of the trains differ in the different Services, and for purposes of ready comparison the details have been tabulated in Appendix A. Here it will suffice to state that the German trains consist of 41 carriages, of which 30 carry sick; the French of 23, of which 16 carry sick; the Austrian of 19, of which 13 carry sick; and the Italian of from 19 to 24, of which 12 to 17 carry sick. The carrying capacity of these trains is as follows:—German 300 sick, French 128, Austrian 104, and Italian 200. The size of the Italian carriages varies, but the number of sick carried is constant, hence the variation above noted in the number of the carriages. The relative carrying power calculated in the number of patients conveyed per axle in the entire train (exclusive of engine and tender) is for the German train 3·66, for the French 2·78, for the Austrian 2·74, and for the Italian 3·87, when large carriages are used (counting each sick carriage at 4 axles), with a slightly higher figure for small carriages, supposing these to possess only 2 axles each. In addition to the above regular trains, the trains of the Société Française and of the Austro-Hungarian Knights of Malta may be mentioned; the former made up of 26 carriages, of which 20 are for sick, and the latter of 16 carriages, of which 10 are for sick. The former carries 300 sick lying down or 500 sitting up, and the latter carries 100 lying down. All Hospital Trains are provided with through communication from carriage to carriage; in the German and French trains the first and last carriages (baggage, etc.) are cut off from the rest; in the Austrian the first waggon only is thus separated; in the Italian train, the communication is complete throughout. This communication is ensured by connecting bridges passing from the rear of one carriage to the front of the carriage immediately behind; these bridges are protected by removable railings in the German, Austrian, and Italian trains. In some Italian carriages these railings are fixed, thereby causing much inconvenience during the entraining of sick.

The German trains are distinguished each by a number, and on both sides of each carriage, near the roof, a red cross on a white ground, 13 to 15 inches square, is painted, and underneath this the designation and number of the train; thus "Lazareth-Zug No. ." In addition each carriage bears, both in and out, a serial number from 1 to 30.

In the French Service, each carriage bears the inscription "Train Sanitaire Permanent No. ," and the Geneva Cross. The carriages of the Austrian train are marked with the Geneva Cross above, and below with number of the train and the special designation of the carriage, *e.g.*, "Arztwagen," "Krankenwagen," etc. These marks are placed on both sides of every carriage, except the goods waggon, the first carriage of the train. The Italian trains carry the Geneva Cross on a metal plate; also the national flag and lanterns of neutrality, but neither

flags nor lanterns are used except when in proximity to the enemy, as being apt to be confused with railway signals, and thus cause danger.

The sick carriages carry in the German Service 10 patients each; in the French Service, 8; (16 in the carriages of the Paris-Lyon-Méditerranée Line); in the Austrian Service, 8; in the Italian Service, a number varying with the size of the carriages, from 12 to 18.

The class of carriage used is, as a rule, a baggage waggon, or a passenger carriage with no elaborate fittings; these fittings are removed or adapted, and the carriage fitted up in a special manner, varying in the different Armies.

In the German trains ordinary 4th Class passenger carriages are used, which possess two-leaved doors at both ends. The stretchers used are the ordinary field-stretchers provided with mattresses and bedding. The lower three stretchers on one side of the carriage are provided with side-pieces, which increase the breadth of the bed thus formed by about 8 inches, the total breadth with this addition being 2 feet 9 inches. These stretchers are arranged in two tiers, six on one side and four on the other; the space thus left empty on the latter side is filled by a stove, water barrel, occasional table, etc. The stretchers are suspended by a spring-hook apparatus to hooks fixed in the walls and supporting pillars of the carriage.

Above each berth is a netting on the roof or side wall for the reception of the minor effects of the patient, and straps are also provided to assist patients to raise themselves in bed. The carriages are provided with oil lamps, and a lantern is also allowed for every carriage. Ventilation is secured by inlets in the roof and louvred openings in the side walls and doors. To each carriage five portable commodes are allowed; these may, if necessary, be kept, when not in use, on the communication platforms, care being taken that they are securely fastened. The doors of the carriage are curtained, and the passage down the centre covered with cocoanut matting. In the French Service special goods waggons are used, provided with sash windows; the springs and couplings are modified to suit the more delicate nature of the traffic for which they are now to be adapted. The stretcher used is a special one called the *lit-brancard*; it is provided with a mattress and bedding, and is suspended from hooks on the walls and supporting pillars of the carriage. The bed of the stretcher is formed of interwoven webbing. The stretchers are arranged in two tiers, four at each end of the carriage, the centre clear space being occupied by the stove, etc. Lighting and ventilation are provided for by a lantern in the roof, and sash windows in the doors and side walls. Light at night is furnished by an oil lamp and a hand lantern. One commode is allowed per waggon.

The Austrians use ordinary baggage or goods waggons. Special stretcher beds (*trag-betten*) are used, and are provided with mattresses and pillows, which are kept rolled up until required for use. Two tiers of stretchers are arranged in each carriage, the upper tier being suspended by webbing straps to hooks fastened in the outer wall of one waggon, with cushions so arranged as to prevent jarring of the stretcher against the

wall. The system is a modification of the Italian and Swiss system, which is described in detail when discussing the improvised Hospital Trains of the Italian Service. The lower tier of stretchers rests immediately on the floor of the waggon. Lighting by windows and lamps, ventilation by door and windows, and, if necessary, by special appliances. Warming ensured by a stove. One commode, opening through floor of the waggon on to the track, is supplied; also a receptacle for dirty linen, etc.

The sick carriages of Italian trains are adapted from passenger carriages which have doors at both ends at least 31 inches in width, are provided with detachable railings to the communicating bridges (this condition, as will be noted hereafter, is not always adhered to), and possess sufficient means of ventilation. The stretchers are arranged in two tiers on brackets which project from vertical uprights; the uprights are firmly braced to the walls of the carriage. Each vertical upright supports two brackets, one at a height of 4 feet 6 inches, the other of one foot from the floor of the carriage. Each bracket projects to a distance of 29 inches from the uprights, and is curved upwards at the termination; it is thus long enough to support both handles at one end of the stretcher, whilst the turned-up end prevents the handles from being dislodged. The stretcher used is a special one called the *Barella-lettucio, sistema Tosi.* This consists of two poles, each about 7 feet 6 inches long, kept apart by iron traverses. These traverses are not fastened directly to the poles, but to arched iron supports, which form not only feet, but head and foot rails to the stretcher; the poles pass through rings in the arched supports. The bed of the stretcher is formed of a double layer of stout canvas, which passes round both poles, and is laced to the head and foot rails. The length of the bed thus formed is a little over 6 feet, and its breadth about 2 feet; the stretcher handles, formed by the ends of the poles, project about 9 inches beyond the traverses, they are slightly knobbed at their extremities on the under-surfaces; this no doubt adds to the security of the stretcher when placed on brackets. The uprights at either end of a carriage should not be less than 18 inches from the wall, and the distance between one upright and the next on the same side must be rather over 6 feet 6 inches. It follows that every bracket, except those on the uprights at the end of the carriage, must support the foot end of one stretcher and the head end of another. Each bed is provided with a mattress, bolster, and pillow. The ordinary means of lighting are used, and a hand lantern per carriage is also allowed. One commode is allowed for every carriage.

The carriage for the medical officers of a train is in all Services specially fitted up for use as a sleeping carriage, or else a specially-built sleeping carriage is supplied. For the subordinate establishment the Germans provide two carriages; the other Services one only. These are, as a rule, fitted up in a manner similar to the carriages for sick. It is not anticipated that this accommodation will be sufficient to provide for the entire establishment; those on duty will sleep in the sick carriages, either on the floor, or in an empty berth, should one be available; others in the kitchen, store, or dispensary waggons.

The kitchen waggon is very elaborately fitted up in all Services; the plates in the German Field Medical Regulations (*Kriegs-Sanitäts-Ordnung*, 1878, Bl. III.) give one, perhaps, the best idea of the nature of these waggons.

The importance of this waggon lies in the fact that the size of the train must be practically limited by its capabilities in the matter of furnishing hospital diets. The waggon is so highly specialised and so expensive that it is obvious that the train must carry as many patients as can be dieted from one such waggon, but no more. To carry fewer would be false economy as wasting power; to carry more is impossible, for it must be remembered that the two main points in which a permanent Hospital Train presents a superiority over an improvised one are:—1. The through communication from carriage to carriage. 2. The fact that the running and timing of the train need not be subordinated to the necessity for stopping to feed the patients.

This last advantage would, of course, be lost at once if more patients than could be satisfactorily fed from the kitchen waggon were carried.

The establishments of Hospital Trains, in the various Armies, are shown in Appendix B.

The following particulars may be noted here:—

The proportion of medical officers to patients in the German train is 1·3 per cent., in the French 1·5 per cent., in the Austrian and Italian about 2 per cent. The Italian carries in addition a director, who relieves the S.M.O. of all administrative duties. As regards subordinate establishment, the Germans allow only a little over 10 per 100 patients, while the other Armies allow about 20 for the same number.

(The obvious fault in the German system would seem to be the short allowance of cooks; one cook and an assistant seem barely sufficient to prepare diets for 300 patients as well as cooking the rations of the establishment. The Italians, with two-thirds the number of patients, have two cooks and two kitchen servants; the Austrians two cooks for only 104 patients. Apart from this consideration, the allowance of one attendant to every 10 patients ought to be sufficient.)

In Germany, those trains, for which materials have been collected in time of peace, are, on the outbreak of war, made up, mobilised and handed over to the P.M.O. of the Field Force for distribution subsequently amongst the various sections of the lines of communications. The rolling stock necessary for making up additional trains will be got together on the recommendation of the P.M.O. with the sanction of the Inspector-General of Railways and Communications, by the Chief of Military Railways. The station of mobilisation will be fixed by the War Ministry, and the necessary equipment be furnished either directly by the same authority from Army Stores, or procured locally by the P.M.O. and Intendance. Additional equipment may be procured if necessary from the railway management through the War Ministry. The local intendant arranges for the provisioning of the train.

In France the different railway companies are intrusted, in time of peace, with the duty of providing and taking care of the special fittings

and furniture necessary for the adaptation of the various waggons, and the Medical Department with the provision and storage of the professional equipment. The companies are bound to provide the trains, properly fitted out, at ten days' notice, and the medical authorities to have their work complete in five. The fitting-up of the train will be supervised by an *Officier d'Administration*, if possible the same officer who will subsequently do duty with the train. Four reserve waggons are provided with every train, and kept till wanted in the depôts in Paris.

The Austrian Hospital Trains are mobilised at various railway stations where large workshops are available. The regulations draw a clear distinction between the technical and professional fitting-out of the train, the former being more particularly the work of the railway authorities, the latter that of the Medical Department. A medical officer is told off as commandant to each train, and he superintends and is personally responsible for the proper fulfilment of the latter duty. He takes the train over when complete, in which performance great care is particularly enjoined.

The Hospital Trains of the Italian Army are worked by the Aid Societies (the Italian Red Cross and the Sovereign Military Order of Malta). On mobilisation the Ministry of War directs the railway companies to collect the rolling stock necessary at certain named stations. The waggons are there stripped of seats, and all unnecessary internal fittings, and handed over to the society for equipment. The society provides the entire equipment of the train, but is not allowed to vary the type of stretcher, or the method of suspension used, without the special sanction of the Ministry. The actual fitting-out of the train is superintended by a delegate of the society, assisted by a military officer.

In the German Army the Committees for Transport of Sick and Wounded indent on the P.M.O. of the Field Force for the number of Hospital Trains they require; that officer then, in consultation with the director of field railways, tells off the trains at his disposal to the various sections of the lines of communications, in compliance with the above indents. Subsequently to this, the trains run under the orders of the Military Railway Direction generally, and of the Line-Commandant locally. Sick-transport committees acquaint the military railway authorities, from time to time, with their wants in the matter of railway transport, and are, in turn, kept informed by the latter of all changes in the general traffic arrangements. The S.M.O. of the train, who is also its commandant, receives from the committee his orders as to where he is to entrain sick.

In the French Service, the medical officers in charge of evacuation hospitals report daily to P.M.O.'s the number of patients awaiting removal. The local details of traffic management are arranged by the P.M.O., the Director of Communications, and the Railway Committee. These authorities correspond daily on all matters affecting the working of the evacuation system.

The general management of all movements of trains, in connection

with the evacuation of sick, is regulated by the Director of Railways and Communications, in consultation with the War Minister.

In the Austrian Service the Staging Committee, acting on the returns sent by the different reserve and field hospitals, makes out a statement of the number of cases awaiting transport for the information of the Railway Management. The latter makes the necessary traffic arrangements, and informs the Staging Committee of their nature, the committee passing on the information to the Road Commandant.

In the Italian Army the medical officer of the despatching hospital indents on the P.M.O. for a train; this indent is passed on to the intendant, and through him to the Director of Transport. This latter officer decides on the class of train to be employed, and, in the case of a permanent Hospital Train being required, informs the delegate of the Aid Society attached to the intendant's staff, who in his turn orders the director of the train selected to carry out the movement.

Sick and wounded do not in any Service come under the care of the S.M.O. of the train until they arrive at the railway station; up to that point the committee for transport of sick and wounded, or the medical officer of the evacuation or field hospital, is responsible for all arrangements, using as a rule requisitioned carriage for the purpose. In the Italian Service it is laid down that should the hospital be close to the station, the railway stretchers may be sent for the patients, the discharging hospital merely supplying the men to carry the stretchers. In all Services the S.M.O. in charge of the train is supposed to personally superintend the entraining of patients.

In the German Service the following rules are laid down:—Patients should, as a rule, travel with their heads in the direction in which the train is proceeding, but this may be varied when it is necessary so to place the patient that a particular side may be towards the centre of the carriage. The S.M.O. will decide which cases are to be changed on to the train-stretchers when in the carriage and which must be transferred before entraining. The coupling chains must be let out to such an extent as to leave a space between carriages equivalent to the length of a stretcher. Before loading up, the stretchers will be placed on the ground at right angles to the direction of the train, and opposite to the space between two carriages, the foot end towards the train. The four men necessary for loading now take post as follows:—Number 1 on the platform of the carriage; numbers 2 and 3 on the right and left of the stretcher, at its foot; number 4 between the handles at the head of the stretcher. Numbers 2, 3, and 4 now raise the stretcher and bring it up to the platform of the carriage, where number 1 seizes the foot end, and number 2 getting on to the carriage platform grasps the head end as it is passed to him. The stretcher is now carried into the carriage, and the patient transferred, if this has not already been done, to the train stretcher. The upper tier is loaded first. Severe cases, especially fractures of upper and lower extremities, are placed on the broadened stretchers already described, otherwise the lower tier of berths will be reserved for such cases as are able to get up.

In the French Service the following rules are laid down:—The patients will be undressed and put to bed on the train stretchers (*lits-brancards*), some convenient waiting or other room in the station (warmed if necessary) being used for the purpose. The four men of the stretcher detachment then carry it to the waggon, and place it at right angles to the latter, and opposite the door, with the head leading. They then again lift it by the rope handles attached to the poles, two men standing on each side advance and place the head end on the floor of the carriage, the numbers at the other end taking care to keep the stretcher level by raising their end. The men at the head end then climb into the waggon, and the stretcher is then pushed in towards its berth till the whole stretcher is resting on the floor of the carriage. The two foot numbers then climb in, and the stretcher is again lifted and carried to its berth, and placed exactly opposite the latter. The stretcher is then again lifted and placed on its supports.

The manœuvre is altogether very elaborate: the stretcher has to be laid down and taken up again three times during the process, and this entails considerable work on the bearers. The upper tiers are loaded before the lower.

In the Austrian Service very elaborate directions are given, which seem worth relating in some detail. A small party, under an officer if possible, is told off to see that all necessary preparations are made for loading up, a suitable platform selected, the train brought up, and ramps or gangways provided (much stress is laid on this point, which undoubtedly facilitates rapid loading). The loading party itself should be ready at the station one hour before the arrival of the patients, to render assistance in preparing the train for their reception. This being done, the different stretcher detachments are told off. Patients, on arrival, are distributed to the different carriages and berths, under the personal superintendence of the commandant. The principles which should guide him in making this distribution are particularised later. Loading up is performed from the side of the carriage, the berths on the side next the platform being loaded before those on the further side, and upper berths before lower. To facilitate this process, it is recommended that the eight patients allotted to each carriage should be set down before that carriage in a single row, as follows: The two centre stretchers of the eight will contain those patients who are destined for the upper berths on the near side; the second stretchers counting outwards in each direction, those for the lower berths on the near side; next to these, those for the upper berths on the far side, and last of all those for the lower berths on the far side. The two ends of a carriage may, with well-practised squads, be loaded simultaneously. In carrying out the selection of patients for different carriages, the following points should be kept in mind:—

1. Is the disability external or internal?
2. Does the patient require much or little attention?
3. Is isolation necessary or not?
4. Is it important that the patient should be kept as quiet as possible?

5. Is there much or little discharge?
6. Is the patient a smoker or non-smoker?
7. The rank of the patient.
8. To what extent is the patient likely to suffer from the oscillation and vibration of the train?
9. The destination of the patient.
10. The personal wishes of the patient.

The points indicated above by the numbers 2, 4, 6, 7 and 8, are the most important; cases that cannot bear shaking should never be in the rearmost carriage. Cron gives the following scheme as an instance of the working of the above principles; the serial number indicates the order of the carriage in the train, beginning behind the goods van:—

1. All cases needing isolation, placed here so that the attendants need not pass through on their way to other cases.

2, 3, 4 and 5. All cases going to Evacuation Station B, with the exception of isolation cases, and such cases as need constant attention. Cases which it is advisable should be disturbed as little as possible in No. 2, as here they are less likely to be disturbed by attendants passing through. 3, 4 and 5 to be divided into smoking and non-smoking carriages, internal and external ailments to be as far as possible kept apart.

6. Carriage for cadets, one year's volunteers, etc.; these should always be near the medical officers' carriage.

7. Medical officers' carriage.

8 & 9. Store and kitchen waggons.

10. Subordinate establishment.

11. Cases needing constant attention; these should always be near medical officers' carriage; smoking should be forbidden, and regard need not be had to the destination of the patients.

12, 13, 14, 15 & 16. All cases going to Evacuation Station A, with the exception of cases needing constant attention or isolation. Cases which it is advisable should be disturbed as little as possible to be put in No. 15; they will here be less troubled by passers through than in 12, 13 and 14, and less likely to suffer from the oscillations of the train than in No. 16. The other four carriages to be divided between smokers and non-smokers, according as their ailments are external or internal.

17. Patients not likely to suffer from the oscillations of the train.

In selecting cases for different berths, the worst cases should be put in the upper berths, as being more accessible; the wounded side should be placed towards the centre of the carriage for the same reason; and lastly, the wishes of the patient should be considered if possible. All manœuvres connected with the loading and unloading of trains should

be practised as repeatedly as possible. The difference between practised and unpractised squads may be equivalent to the difference between a few minutes and as many hours; 20 minutes may be looked on as a good average time for the actual entraining.

In the Italian Service, as already stated, the train stretchers may be sent for the wounded, if the hospital be close at hand; otherwise, they will be brought to the station on requisitioned carriage. In either case, the stretchers, when loaded, will be placed in two groups; in the one those whose injuries are most accessible from the right, and in the other those whose injuries are most accessible from the left; the two groups are equalised by the allotment of those patients whose position is a matter of indifference. The stretchers are then carried to the train and arranged in two ranks, the group first named above in the front rank, with one pace interval between stretchers. The loading party is then told off in squads of six, with, in addition, a superintendent of the first class and one of the second class to each squad; three men and one superintendent then take post on the station platform, the others on the platform of the carriage. The half-squad on the station platform take up a stretcher and carry it to the carriage platform, and pass it to the other half-squad; the other half carry it into the carriage and deposit it in its right place on the brackets. Loading is carried out, beginning at the right of the door of entrance and working round to the left, the lower stretcher of each pair being deposited before the upper. In case of the carriage not being provided with removable platform rails, the train must be broken up into groups of two carriages, with a space of about six yards between groups. Squads of three men and one superintendent will then be formed, and these will then each take entire charge of a stretcher throughout the manœuvres, and, after depositing it in its proper place in the carriage, will proceed along the corridor and leave the carriage by the door at the further end of the group. In the first case each squad will have 50, in the latter 25, patients to entrain.

In the German Service, the commandant of the train receives from the Sick-Transport Committee written instructions on all important points connected with the journey—*e.g.*, times of stopping and starting, long halts, rest and refreshment stations, etc., the line of railway in the home territory to which the train is bound, or its destination, so far as it has been communicated to the committee. When all the sick and wounded have been entrained, the commandant will go round to every carriage and satisfy himself that everything is correct as regards the loading up of the patients, the telling off of the attendants to the various sick-carriages, etc. He will then report to the committee, and to the commandant of the railway station, that the train is ready for starting. No instructions are given in the *Kriegs-Sanitäts-Ordnung* as regards the pace at which the train will be run, or what means should be used for stopping the train when in motion. At every stop the commandant will report himself to the commandant of the railway station, and ask for orders; should such orders not be in agreement with those previously received from the Sick Transport Committee, or not, in his opinion,

compatible with the interests of the patients in the train, it is his duty to obtain a written copy of them, if the commandant of the station insist upon their execution.

The instructions given in the French Regulations are rather meagre, and merely state that telegraphic notice should be sent in advance along the line whenever a train starts, to inform the authorities at stopping stations of strength of party, time of arrival, etc. On purely military lines, the pace of these trains will not exceed that of ordinary military trains. On lines where peace conditions still prevail, this pace may be increased up to a limit of about 25 miles per hour. There are no special directions given for stopping the train when in motion.

The Austrian regulations lay down that the commandant of the train should (if possible, 24 hours before the departure of the train) fix, in consultation with the railway station commandant, the various details of the journey—*e.g.*, the routes to be followed and the stopping stations; advise station commandants of those places where long stops will be made; arrange general preparations for entraining, and fix the hour of the same; and, finally, obtain all the information he can as to the route he is to follow. After entraining is completed, the carriage orderlies report all correct to the N.C.O. of the train (*Zug-inspection*), who, in turn, reports to the commandant. This latter officer then takes a look round the train, and reports to the station commandant that the train is ready to start. The rate of travelling is laid down at 12 to 15 miles per hour, which is not to be exceeded except under special circumstances. In hostile or disturbed territory, the train will, as a rule, halt for the night in some convenient empty siding.

(This last order is noteworthy, as it is not contained in the regulations of any other Service. If a necessary order, it would seem to point to the inadvisability of using permanent Hospital Trains near the front at all, as their great advantage—viz., being able to travel uninterruptedly—is thus thrown away.)

To stop the train in motion, signal flags by day and hand lanterns by night are to be waved outside the window, but this expedient must only be resorted to in cases of great necessity, as, for instance, fire or other accident, or to permit of the carrying out of some emergent treatment which demands absolute freedom from vibration, such as the ligature of a vessel. To avoid mistakes it is laid down that cloths and rags are not to be thrown out or shaken out of a window whilst a train is in motion. An excellent graphic time-table (*Marschplan*) is given to the commandant, in which are given the names of stations where stops will be made, the duration of the same, and the time at which they will occur. The length of a journey is indicated by a thick line along which the names of the stations are written at suitable intervals; thin transverse lines denote the change from one system to another, and the portion traversed between midnight and midnight is enclosed between thick transverse lines.

In the Italian Service, permanent Hospital Trains run in accordance with the time-table laid down for military traffic generally, or with the

ordinary time-table, whichever happens to be in force on the portion of line traversed; the route followed is laid down by the intendant. No directions are laid down in the "*Regolamente pel Trasporto sulle Ferrovie, del Feriti e Malati in Guerra*" as regards the pace of the train or the measures to be taken to stop it in the case of accident or other emergency.

The keynote of the work in a permanent Hospital Train is its continuity. This applies to trains of this class in all Services, and serves to distinguish them from the next class of improvised Hospital Trains. The French regulations lay down that these trains "constitute veritable rolling hospitals, and are administered as such." True though this is, to a certain extent, no doubt, yet there is some exaggeration in the statement, which is recognised by such leading authorities as Cron and Zur Nieden, who point out that such a train lacks one of the leading characteristics of a hospital, in that, owing to the necessarily short stay of the patient, and the limited space available, no independent line of treatment can be initiated in it, nor can any elaborate operation be performed. Thus the medical officer of the train must be reduced to a pure conservatism, and to carrying on or developing, on lines already laid down by others, the treatment of the patients under his care, and may consider his duties fulfilled if he hand over his cases at least no worse than when he took them over. This may seem rather a pessimistic view of the position, but it is one held by men of experience, and there is indubitably an advantage in expecting as little while trying to get as much as possible out of the system.

The following points may be particularly touched on :–

The Germans allot one hospital assistant and one nursing orderly to every pair of sick carriages; each of these wears a metal label in the button-hole of his coat, the former having the odd, and the latter the even, number of the pair of carriages stamped on his label; one of these two men must always be on duty in this pair of carriages.

The French lay down no particular directions. The regulations do not provide for more than one attendant per carriage, with about four in reserve.

The Austrians are better provided in this respect, as 13 attendants travel in the sick carriages, leaving (after deduction of cooks and dispensary assistant) a balance of 9 men in reserve, in addition to 3 officers' servants, who may also, if necessary, be utilised.

The Italians, with their greatest number of carriages (18), can leave a reserve of 6 nursing orderlies and four officers' servants. No definite directions, however, are laid down.

In the German Service the commandant decides in which carriage a night watch shall be kept; in this a bed is made up either on the floor of the corridor or in a spare berth, for the attendant detailed for this duty.

A practically similar arrangement obtains throughout all Services, and as a matter of fact a portion of the establishment must, owing to want of accommodation elsewhere, sleep in the sick-carriages. Cron

points out the advisability of keeping night-duties as low as possible, in consideration of the inevitably great stress of work during the day.

(Such a matter must in effect be left to the discretion of the S. M. O., and probably would be best solved by posting an attendant in each carriage indifferently; it is difficult to see any other satisfactory solution of this problem, except putting on a certain number of men as a night patrol. Obviously a sleeping attendant in the next carriage is not of much use to a helpless patient.)

The general idea is that the work of a train should be assimilated as nearly as possible to that of a field hospital, regular visits being made, drugs being dispensed in the train, and so on. Cron emphasises the necessity of having the establishment thoroughly drilled in their duties during the journey of the train empty, to the front, and having a time-table (of which he gives a very excellent specimen) made out, in which every day and every hour should have its appropriate duty. The greatest cleanliness is enjoined in all Services; all stools should be disinfected, immediately on being passed, by means of disinfectant solutions placed in the bed-pans and commodes. In the French carriage a trap-door exists, through which the contents can be emptied. In the Austrian regulations it is laid down that bed-pans are only to be used when absolutely necessary, and their contents are to be emptied from the bridge, between two carriages, and not from the windows. Immediately after being emptied they must be filled with 5 per cent. carbolic lotion. In the Austrian and French trains tubs of disinfectant are placed in the leading luggage van, in which all soiled linen should be placed at once or during the first halt; the same regulations advise that all soiled dressings should be at the same time taken to and burnt in the furnace of the engine, being kept till then covered with disinfectant in some convenient receptacle.

Ventilation must be carefully attended to, which, as Cron points out, may be difficult to reconcile in cold weather with the proper warming of the carriage. He gives 50 Fahr. as the lowest temperature which should be allowed. In warm weather the carriage may be freely opened; when this is impossible or inadvisable, every means must be taken to keep the air in the carriages as fresh as possible; smoking may if necessary be completely stopped, pipes and tobacco being confiscated, if mere prohibition be insufficient. The cubic space allowed per man in the Austrian sick carriage is only 150 cubic feet; the regulations of other nations give no information on this point.

Patients in permanent Hospital Trains are always dieted in the train, on ordinary Field Hospital scales as a rule. The establishment is also dieted on the train whilst travelling; during protracted halts they may be rationed by the commissariat of the locality. The Italian gives only two meals per diem, the other trains three.

In the German trains one of the assistant surgeons is told off specially for dispensing, with a hospital assistant to aid him; in other Services special officials are attached to the train for this duty. The German regulations enjoin simplicity in prescriptions.

The manœuvre of detraining is the reverse of that of entraining; the French method is, however, somewhat simpler, the stretcher not being deposited and lifted again so often.

In all cases the responsibility of the medical officer of the train ceases when the patient leaves the train, the authorities of the receiving hospital being responsible for all subsequent arrangements. His duties in this respect, therefore, are limited to the purely professional handing over of his patients and their documents. It is generally enjoined that patients should only be transferred *en route* when it is quite impossible to carry them any further; in such a case they may be left at any suitable hospital *en route*, previous notice being, if possible, given.

Should a patient die in the train, the corpse must be handed over to the first military or civil authorities that are met with, notice being, if possible, sent in advance. The Italian train is the only one which provides a special partially fitted-up carriage which can be used as a mortuary or isolation carriage, as the case may be. Wasserfuhr considers that it should be always possible to avoid this contingency by timely evacuation, and Myrdacz states that only one death occurred in a train in motion during the war of 1878-9 in Bosnia. (There were four hospital trains, which carried in all 6,431 sick and wounded during this war.)

In the German Army the following transfer documents accompany the party:—

1. Transfer Roll (*Namensverzeichniss*).—A simple nominal roll, giving the information usually given in an admission and discharge book. This roll is signed by the receiving medical officer at the end of the journey, as a voucher. Deaths *en route*, transfers to hospitals other than that at the termination of the journey, are entered in a remarks column.

2. Way-Bill (*Begleitschein*).—A form handed over partially filled up by the sick transport committee to the medical officer in charge of the train on his taking over the party. The first page consists of four parts.

The first part contains a numerical state of the number of men entrained, with the following particulars, date, and place of entraining; the number of men is classified as:—

a. Germans and allies;
b. Prisoners, and
Total

each of these classes being again divided into sick and wounded.

The second part of this page is a similar state, similarly divided, showing the discharges from the train.

The third part is a column for the signatures of the medical officers taking over cases from the train, and the fourth is a column for remarks.

The first part is filled up by the sick transport committee (or other authority handing over cases for the train), the second and fourth by the medical officer in charge of the train, and the third by the medical officers or other authorities taking over cases from the train.

The second page contains the strength of the escort, if any (this practically only applies to ordinary trains), and the strength of the nursing establishment, and statements of the amount of extra equipment

taken and handed over with the party or with individual patients. These last particulars do not as a rule, however, concern permanent Hospital Trains.

In the French Service a transfer roll (*feuille d'évacuation*) is made out for every party ; it contains the following information, in addition to the names of the men, viz., the order authorising the movement, the destination of the party, the medical establishment accompanying it, and any changes occurring *en route*. This roll is handed over to the *officier d'administration* of the train, together with the small books and hospital tickets (*livrets individuels*, *billets d'hôpital*) of the patients. It is eventually signed by the medical officer of the receiving hospital at the end of the journey, and returned to the medical officer of the despatching hospital as a voucher.

In the Austrian Army patients are taken over with the following documents :—

a. A nominal roll or rolls, acting as last rationing certificates.

b. A single nominal roll for the whole party, acting as a transfer roll.

c. Identification papers (*Legitimations-blätter*). These papers are handed over with the party at the end of the journey.

In the Italian Army the S.M.O. of the despatching hospital takes out the following documents :—

For each patient a clinical chart (*cartella clinica*), or otherwise a diagnosis label (*tabellina diagnostica*).

For the entire party a transfer roll in duplicate (*Foglio di traslocazione*). This roll is used by the medical officer in charge of the train to check the party when taking over, and is subsequently handed over by him, after making any remarks he may think fit, to the medical officer in charge of the receiving hospital, together with the clinical charts. One copy is signed by the medical officer of the receiving hospital, and is returned as a voucher to the despatching hospital. In case of the death or transfer of a patient *en route* a descriptive roll (*foglio di consegna*) is handed over with the corpse or patient, and an explanatory note entered in the original *foglio di traslocazione*.

In the German Service the disinfection of trains is left to the discretion of the medical officer in charge, who will, should he think proper, recommend in writing to the commandant of the railway station the performance of the process, mentioning at the same time the process to be employed. For carriages without special fittings (this, in effect, applies more to the trains of the other two classes) it is recommended that the floor and inside of the carriage generally should be swept out and swabbed, and then exposed to the action of steam at 212° F., or of water at 160 F. ; a hot 5 per cent. solution of caustic potash, or soda, is recommended for swabbing out with ; chloride of lime may be used in the same way.

The French make no mention in their regulations of this question as regards permanent Hospital Trains.

In the Austrian Service, it is laid down that every train should

be disinfected immediately after use either at the discharging or nearest convenient station; it is carried out by the train establishment. The following measures are prescribed:—All removable articles that will stand washing should be soaked for 24 hours in a 2 per cent. solution of carbolic acid. The floors and walls, and wooden and metal fixtures, and leather straps, should be scrubbed first with boiling water, and then with soft soap containing 2 per cent. carbolic acid, then swabbed with wet cloths, and lastly rubbed with a dry cloth. Commodes and bed pans should be cleaned with chloride of lime. All silk and woollen material must be sprinkled once a day, for three days, with a 2 per cent. solution of carbolic acid; if much stained or soiled they should be removed and steamed or burnt. After disinfection the carriages should be allowed to stand open for 48 hours in a free current of air.

In the Italian Service the ordinary cleansing of the inside of the train is performed by the establishment of the train; that of the outside and the disinfection of the inside, should this be necessary, by the railway station staff. After an ordinary journey, in which only non-infectious diseases or injuries have been carried, a simple scrubbing and sweeping will be sufficient; this may be done with hot water only, or, as when cattle trucks have to be adapted as sick carriages (this applies mostly to improvised Hospital Trains, *q.v.*), with 5 per cent. solution of carbonate of soda, quicklime, etc. All parts of the floor or the canvas of stretchers, which have been soiled with blood or other discharges, should be repeatedly cleaned with the following solution:—Corrosive sublimate 3 parts, hydrochloric acid or common salt 5 parts, water 1,000 parts. Soiled linen should, till it can be washed, be kept immersed in a similar solution. Mattresses, pillows, etc., which have been soiled should be returned to the society's stores. All carriages which have been used for infectious cases, or which have made several journeys (six or eight) with ordinary cases, should, in addition to the above precautions, be fumigated. To effect this, a portable charcoal brazier should be placed on the floor of the carriage, care being taken to strew a sufficient amount of earth beneath it to avoid all danger of fire; sulphur should be burnt on this in the proportion of 25 grammes per cubic metre (about 11 grains per cubic foot) of the internal capacity of the carriage. The carriage should be kept closed for two hours; it should then be thoroughly aired, and washed again with perchloride of mercury solution. Such minor articles as do not appear to have been thoroughly disinfected may be burnt.

Improvised Hospital Trains.

The second class of trains used for the transport of sick and wounded consists of improvised Hospital Trains. German, *Hülfslazarethzüge*; French, *Trains Sanitaires Improvisés*; Austrian, *Kranken-Züge*; Italian, *Treni Attrezati e Improvvisori transporto Feriti e Malati.* These trains differ from permanent Hospital Trains, in that whereas the latter are organised units, the former are merely aggregates of carriages got together for the moment, established and equipped in a merely temporary manner, and

have, in the majority of cases, no fixed size or arrangement. In addition they do not possess any means of through communication from carriage to carriage, nor is there any kitchen carriage provided. They are intended as stated in the French regulations (the rule is, however, universally true), for the transport of such sick and wounded as need lying down accommodation, but whose condition is not such as to demand constant medical attention.

In the German Army, there is no definite formation laid down for these trains, but a maximum of 80 axles is given as a guide.

The French train consists, as a rule, of 40 waggons, arranged as follows :—

1. Brake van for equipment and baggage.
2 to 11. Carriages for sick.
12 and 13. Brake vans.
14 to 19. Carriages for sick.
20. Carriage for establishment, with one compartment available for four sick sitting up.
21 to 27. Carriages for sick.
28 and 29. Brake vans.
30 to 39. Carriages for sick.
40. Brake van.

The Austrians have no fixed rules for these points.

The Italians have two classes of improvised Hospital Trains, viz. : *Treni Attrezati* and *Treni Provvisori*. The former have a definite size and formation, and are composed of 38 carriages arranged in the following order :—

1. Baggage waggon.
2 to 19. Carriages for sick.
20. Carriage for medical establishment.
21. Store waggon.

Treni Provvisori have no definite size or arrangement.

In the German trains, red crosses on a white ground, 20 inches square, made of cloth, are fastened on the right and left side of carriages alternately; the train has a special number, and all the carriages are also numbered. At the end of a journey, these crosses must be removed from all carriages not intended for the carriage of medical store to the front.

In the French trains the first and last carriages of the train fly the Red Cross and national flags, and every carriage bears on one side or other, a red cross on a white ground, made either of metal or cloth. Every carriage is marked with a number, and the use to which it is put is also written on it.

The Austrian regulations do not apparently lay down any directions in this matter.

The Italian *Treni Attrezati* carry the same distinctive marks as the permanent Hospital Trains of the same Service. The *Treni Provvisori* carry only the Red Cross and national flags, and the lanterns of neutrality.

In the German Service any baggage waggon, or 4th Class passenger waggon, without permanent seats or other fixtures likely to interfere with the entraining of the sick, may be used. Such waggons are to be preferred which have windows or ventilation openings in the side walls or doors; where these do not exist, openings should be cut out in the doors, and covered with some light transparent material.

Two systems are used for the suspension of stretchers, the Hamburg system and Grund's system. In the Hamburg system the stretchers are hung from the roof by an apparatus consisting of:—

1. An automatic clamp (*griffe au diable*), which grips the roof beam of the waggon.
2. A coiled spring attached to the clamp.
3. A chain hanging from the case of the spring.
4. An iron bar hanging vertically from the chain. At each end of this bar is a square ring, which serves to hold the handle of a stretcher.

To carry two stretchers, one above the other, four of the above arrangements are necessary; the height of the stretchers from the floor may be regulated by taking up or letting out links of the chains. The feet of the lower stretcher should not be more than 3 inches from the ground, and the vertical distance between the stretchers is a little short of 3 feet. The distance between the ends of the stretcher handles, and the end walls of the waggon should be about 6 inches. Lateral movements are prevented by steel spring rings, fastened to the stretcher handles, and to hooks on the side walls of the waggons. There is no arrangement for holding stretchers down except their own weight and that of the patients. Eight stretchers may be carried in each waggon on this system. Grund's system consists of strong arched springs, joined by stout traverses, running from the crest of the arch of one spring to that of another. Two springs thus joined are placed at each extremity of the waggon, and two more at somewhat less than a stretcher length from each of these. Each waggon, therefore, contains eight stretcher springs and four traverses, so arranged that the traverses run at right angles to the long axis of the waggon; stretchers are now laid upon these traverses, three at each end of the waggon. Each stretcher comes into relation with two traverses and four springs. Each spring terminates at one end in a shoe, which is strongly bolted to the floor of the waggon, and at the other in a pair of rollers, which permit of a certain amount of movement of the spring; from the crest of the arch of the spring two plates of metal project vertically, forming a slot in which the end of a traverse is placed. By both the Hamburg and Grund's systems the centre of the waggon is left free for attendants, necessary articles of equipment, and in the cold weather a stove. The French use covered baggage waggons, preferably those which possess means of ventilation, and are in good repair; brake vans should not be used, as the jar of the brake is bad for the patients. The systems of suspension used are two:—

1. The *Appareil à deux étages, modèle 1874-89, système Bry-Ameline*; and

2. The *Appareil à trois étages, modèle 1891, système Bechot-Desprez-Ameline.*

In the *Appareil à deux étages*, the stretchers are supported in two tiers on traverses, each pair of traverses supporting three stretchers, as in Grund's system.

The traverses are not, however, supported from below, but slung by spring-hooks from iron plates, which are firmly bolted to the side walls of the waggon; the ends of the traverses which support the head ends of the stretchers are allowed free vertical movement in a groove in the iron plate, the others are not confined in any way. The stretcher handles are fastened to the head end traverses only, by leather loops, six in number on each such traverse.

The *Appareil à trois étages* consists of an iron framework or cage, rectangular in shape, inside of which three stretchers are slung. The component parts of this framework are as follows:—

1. Two end pieces; these consist each of two strong uprights, joined together by three rather slight traverses (*entretoises*); these traverses are not straight, but slightly bent at either end in a vertical plane. These end pieces are joined at top and bottom by
2. Four stout iron rods (*traverses d'assemblage*), which complete the framework. The ends of these rods pass through holes in the uprights, and nuts are screwed on to the projecting portions to fix them.

To each upright are fastened three spring hooks, each at a definite distance above one of the *entretoises*. From each spring hook on any upright to the corresponding hook on the other upright, at the same end of the framework, passes a swinging traverse (*traverse porte-brancard*) on which the stretcher rests. Every stretcher thus rests on two swinging traverses and four spring hooks. The swinging traverses hang at slightly higher level than the corresponding fixed traverses. The *Appareil à trois étages* measures when put up 6 feet in height, 6 feet in length, and 3 feet in breadth. It is packed for carriage in two portions.—*a.* The two end pieces, with fixed and swinging traverses complete, are placed together, the head of one in contact with the feet of the other, and the outer aspects touching; they are kept secure by lashings of wire or packthread. Each swinging traverse is similarly lashed to its corresponding fixed traverse to prevent damage. *b.* The four *traverses d'assemblage* are kept in one package by means of two short boards, in which holes are made; through these the ends of the traverses are passed and there fixed by the nuts used for fixing them to the uprights of the framework. The total space occupied by this *Appareil*, when packed, is about 10·75 cubic feet; its weight is 127 lbs.

Three men are necessary for the manœuvre of putting the framework together; this, including unpacking and placing ready for use in a waggon, is calculated to take 15 minutes. Four frameworks can be placed in each waggon, the long axes of the frameworks being parallel to the

direction of the train. A fifth may exceptionally be placed in the centre of the waggon across it. (This could only be justifiable under conditions of extraordinary pressure, and for short distances. It would completely prevent any attention being paid to the sick, and would reduce the cubic space per patient to 70 cubic feet.)

The Austrians and Italians use the Swiss system. The apparatus consists of eight uprights of pine wood 6 feet 9 inches in height, 5 feet 5 inches in breadth, and 1 inch thick. Four uprights are placed on each side of the waggon and bolted to the wall, with which they do not, however, come into actual contact, the bolts passing through blocks of wood between the uprights and the walls. Except at these points, then, there is a space left between the uprights and the walls of the waggon. Holes are drilled in each upright at a height of 3 feet, and 5 feet 8 inches from the ground. Through these stout hooks are passed. These hooks are made of iron, and the shanks are bent at right angles in a vertical direction, so that that portion of the hook that projects on the further side of the upright is closely applied to the outer surface of the latter; the greater the downward pull the more strongly will this vertical piece of the shank press against the upright. The extremity of the shank has a short stout spur, which presses into the wood of the upright and assists to fix it. From these hooks the stretchers are slung by means of webbing or hempen-plait slings. These are 2 feet 5 inches long, and are doubled over so as to have a long and a short end. At the point at which it is doubled over the sling passes through a triangular metal ring, to which it is securely fastened; the free ends are doubled back and stitched to form loops. The triangular ring is now hitched on to a hook on an upright, the long end of the sling being towards the centre of the waggon. This long end now receives the outer handle of a stretcher, the short end the inner handle. Each stretcher thus depends on two hooks and two uprights. If it is required to sling three stretchers one above the other, three holes for hooks are bored in the uprights, at distances of 2 feet 2 inches, 4 feet 3 inches, and 6 feet 3 inches from the ground. The same slings are used, the short ends supporting the outer handles of the stretchers, the long ends being looped round the handles on the inner side in such a manner as to equalise matters and keep the stretcher level. In this arrangement the lowest stretcher will hang at a distance of about 4 inches from the floor of the waggon. The arrangement in two tiers is, however, that more usually adopted, and allows of eight patients being carried in each waggon. In fixing the uprights, the minimum distance from an upright to an end wall must be 8 inches; from one upright to the next on the same side, 6 feet.

It may be of advantage to shortly compare the above systems, in respect of the various disadvantages, or otherwise, of each.

1. *The necessity of making more or less elaborate changes in carriages.*—This applies to the Italian and Bry-Ameline systems more particularly; in a less degree to that of Grund. The two former demand a considerable amount of carpentering skill.

2. *Dependence on the walls and roof of the carriage.* — The Hamburg system brings a great strain to bear on the roof beams, the Bry-Ameline, and to a less extent the Italian system, on the side walls. Bolts screwed through wood, where the channel is not metal-lined, necessarily become insecure after a time, if exposed to much vibration, with a constant strain acting in the length of the bolt.

3. *The possession of special apparatus.*—This objection applies to all spring-hook apparatus, and is the greater the greater the weight placed on the hook. For instance, the breaking of a spring hook in the Bry-Ameline system would be a much more serious affair than a similar accident occurring in the *Appareil à trois étages;* in the former we would have three stretchers suddenly let down at one end, in the latter only one stretcher would fall at one end and would be at once caught and supported by the fixed traverse below. It may be safely laid down that whenever spring hooks are used a considerable reserve should be carried, and that the possession of a spring hook on which the safety of several stretchers absolutely depends forms an almost fatal objection to any system. The springs of Grund's system are so strong that a similar objection does not apply to them. There is a danger in this case, however, of the springs being too stiff and not working unless loaded up to the maximum weight, which may not always be possible.

4. *Oscillation.*—This applies mostly to the Hamburg system, and next to the Italian. In Sigel's modification of the latter, used in the Austrian Service both for trains and hospital ships, india-rubber fenders are used to obviate the jarring of the stretchers against the side of the carriage or the bulwarks of the ship. Grund's system seems to be most free from this objection.

5. *Over-crowding of Stretchers.*—This applies especially to Grund's and the Bry-Ameline systems. With three stretchers it must be difficult to get at or do anything for the man on the centre stretcher, especially on the lower tier. For instance, the breadth of a luggage van, as shown in the diagrams in the *Kriegs-Sanitäts-Ordnung*, is 7 feet 6 inches; the breadth of the regulation German stretcher is 22 inches; three of these last, therefore, occupy a space of 5 feet 6 inches, leaving for the four interspaces between the outside stretchers and the side wall, and on either side of the middle stretcher, a total residue space of 2 feet. This does not give an attendant more than enough space to stand uncomfortably in, certainly not enough to kneel or stoop in. This objection is stronger in a double-tier system as the Bry-Ameline or Richter's modification of Grund's system.

The *Appareil à trois étages* seems, on the whole, freer from objection than any other. It necessitates no alteration in the carriage, it depends on neither the roof nor the walls, the spring hooks play a less responsible part than in any other spring-hook system, and the danger of any one of them breaking is discounted by the presence of the fixed traverse immediately below. The lateral distance between stretchers is over 18 inches. The *Appareil* is, in addition, of almost universal applicability, whether for use in trains, boats, or country carts. Two improvements may be suggested:—(*a*) the provision of somewhat broader feet for the uprights; and (*b*) that the rings on the uprights, to which the spring hooks are fastened, should have a spring opening, so that a broken hook may be rapidly replaced.

In the absence of any of the above forms of apparatus it is generally laid down that use must be made of any available local resources whereby jolting may be diminished. The French suggest the use of palliasses stuffed with straw, the corners being left empty and bound with cord to form handles. If stretchers are used they should never be laid directly on the floor of the waggon, the handles should be supported on faggots, bundles of straw, etc. Palliasses or stretchers should be laid parallel to the long axis of the carriage, three at each end, a seventh being exceptionally placed crosswise in the centre. The Italian regulations give few instructions and apparently allow of stretchers being placed directly on the floor of the waggon, as well as of the use of loose straw. Neither of these methods should ever be used except in extremity. Of the latter, Cron says that it is "very primitive, likely to catch fire, and cruel to the patient." The Italian *Treni Provvisori* are always fixed up in some such way.

In addition to the above official systems, two others, not recognised as such, may be described.

1. The Zavodovsky system.—This is official in the British and Russian Services, and is sufficiently well known not to need detailed description. Its chief defect is that great reliance has to be placed on the large iron hooks which form the keystone of the structure. The consequences of one of these "drawing out" or breaking would be extremely serious. In addition, a great strain is thrown on the roof and side-walls of the carriage. Otis, the leading American authority, objects to this system, that the knotting and splicing of the ropes which form the suspension would require the assistance of specially-trained men; he also anticipates the occurrence of considerable oscillation. Rédard, on the other hand, strongly approves of it.

2. The *Rédard-Chevallier* system.—In this system the stretchers are arranged in two or three tiers, and are suspended from the roof and side walls by spring-hooks and iron rods. A great deal of dependence is placed on these somewhat delicate pieces of mechanism, and the strain on the roof

must be considerable. The springs used are of peculiar design, and it is claimed for them by the authors that they are less liable to break than those in ordinary use. Oscillation is prevented by a complicated system of guy-ropes.

The following accommodation is provided by the different improvised systems described :—

Hamburg, 8 sick per carriage.
Grund's, 6 sick per carriage (Richter's modification, not official, 12).
Appareil à trois étages, and Bry-Ameline systems, 12.
Austrian and Italian systems, 8, and on emergency, 12.
Zavodovsky system, 8.
Rédard-Chevallier, 8 or 12, as desired

It is laid down by Rédard that ordinarily not more than eight or ten patients should be carried in an ordinary van ; this gives about 130 to 100 cubic feet per patient.

In the German Service the following equipment is furnished by the Sick Transport Committee for every improvised Hospital Train :—

For every patient one mattress and blankets as required ; for every waggon one water-can with drinking-cup, one glass or earthenware medicine measure, one standing basin, one lamp, one hand-lantern, and one signal flag.

The committee also supplies such drugs as may be required on the indent of the S.M.O. of the train, and a supply of comforts is also allowed.

In the French Service the following equipment is provided :—

For every patient one cup and one mug of tisane, and bed and body linen as required.

For every waggon, one commode, one bed-pan, one spittoon, one pail of pure water, one pail of tisane, and one camp stool. The medical equipment consists of a medicine chest (called variously *"cantine médicale"* and *"caisse de médicaments,"* contents not stated. Medical comforts, a camp kettle and a small stock of fuel are also provided. The Evacuation Hospitals supply the above articles, being specially equipped with a view to this purpose.

The Austrian train is equipped as follows :—One small medicine chest, one small dressing haversack with surgical instruments and various dressing materials, ten each of the following articles, viz. :—drinking-cups, pails for water, bed-pans, urinals, lanterns with candles. For every waggon, one camp stool, one hand-basin, and, if possible and necessary, a stove.

The Italian *Treno Attrezato* has a very complete medical and surgical equipment, contained in two boxes, with two boxes of medical comforts and cooking utensils. One lantern is allowed per carriage. In the *Treni Provvisori* we only find a medicine chest (*cassa da medicazione*) per train, other equipment depending on the possibilities of the case. In both the Italian and Austrian trains the dispatching hospital provides all necessary bedding.

The extent of the establishment is decided in the case of German trains by the exigencies and possibilities of the moment. One or two medical officers, two hospital assistants, and 12 to 15 nursing orderlies, per 100 patients are the rule. These are supplied by the Sick Transport Committee.

The French allow one *médecin aide-major*, one *pharmacien aide-major*, one *officier d'administration*, and 45 *infirmiers* to every train of 38 carriages. This establishment is furnished by the Evacuation Hospital.

In the Austrian train a military medical officer is, if available, sent with the train; in default a civilian practitioner is employed, a combatant officer being sent in this case to act as commandant of the train. In addition three under-officers per train, and one nursing-orderly to every carriage containing serious cases, or to every two containing slight cases, are allowed.

The Italians have a definite establishment for every *Treno Attrezato*, viz., 4 medical officers, 2 under-officers, 5 N.C.O.'s, and 35 privates, with 4 officer's servants. The medical officers are taken from the reserve of officers and the territorial militia, the remainder of the establishment from the militia. They are detailed for duty by P.M.O. of the Army and sent to the front as required. In the case of *Treni Provvisori* all the above class of men are represented, and care should be taken that the following minimum establishment is provided, viz., one medical officer and one N.C.O. to each train, and one sick attendant to each carriage. These are furnished locally when the trains are made up.

In the German Service improvised Hospital Trains are made up by the Committees for Transport of sick and wounded, under the orders of the Inspector-General of Railways and Communications, on requisition by the committee through the P.M.O. of the field force. The necessary rolling stock is detailed by the Chief of Field Railways. In the French Service the P.M.O. of Communications, acting on the information contained in the daily reports from the Evacuation Hospitals, recommends to the Directors of Communications the formation of the necessary improvised trains. The necessary rolling stock is then handed over to the medical officer in charge of the Evacuation Hospital, or to the delegate of the aid society, who fit out the train with the aid of the establishment told off for the train. The local railway authorities are enjoined to render every assistance. It is calculated that working with six squads of six men each, two squads being told off to each section of the train, four hours should be sufficient to fit out a train of 33 carriages, including unpacking the apparatus, affixing the badges of neutrality, etc. Using the *Appareil à trois étages*, rather less time should suffice.

In the Austrian Service the G.O.C. gives all the necessary orders for the formation of these trains, on the recommendation of the P.M.O.

In the Italian Service the procedure is the same as in the case of permanent Hospital Trains, the intendant deciding which class of train shall be used in any particular case. The necessary stores may be collected at one station or distributed along the line at the various stations

in the vicinity of the hospitals which have to be evacuated. The P.M.O. informs telegraphically the medical officers of the various hospitals of the formation of the train, acquainting them with the accommodation allotted to each, and also with the timing of the train. The Italian train differs from those of the other Services in that whereas the latter are formed at the front, to take back men to the rear, the former are formed at the rear and sent forward to fetch men back from the front. The *Treni Provvisori* are, however, made up at the front, as in the case of the other Services.

In the German Service no special directions are laid down for the reception and entraining of patients; presumably those given for permanent trains would, *mutatis mutandis*, be followed.

In the French Service it is recommended that the S.M.O. of the train should arrange for a sheltered platform or siding for this purpose, using waiting or other rooms for the assembling of the patients. Such patients as are able to walk should be assisted to their carriages by the *infirmiers*, and placed on their stretchers; the remainder are carried by four men to the train on stretchers. In loading with the Bry-Ameline apparatus the following manœuvres are necessary: four men take post in the waggon as follows:—No. 1 between a head-end traverse and the end-wall of the waggon, No. 2 between the traverses, Nos. 3 and 4 opposite the door of entrance. The stretcher is passed in by the four men who have brought it to the train, and taken charge of by Nos. 3 and 4, and by them deposited on the floor of and across the carriage. It is then lifted up and the head-end passed across the traverse to No. 2, and by him to No. 1. No. 1, and No. 3, who still retains hold of the foot-end of the stretcher, now carefully lower it on to the traverses in its correct position, the former fastening the head-end by means of the straps on the traverse. The outer stretchers at one side are fixed on first, then those at the other side, lastly those in the centre of the pair of traverses, those on the lower tier being fixed before those on the upper tier, in each case. The comparatively small space between the stretchers must make the manœuvre of loading up the centre stretcher of the upper tier a difficult one. In the case of the *Appareil à trois étages* four men take post at the door of the waggon and receive the stretcher as it is passed in to them, and proceed to load it on to the swinging traverses, passing it either through the end of the framework, or obliquely from the side. Care must be taken not to strike it against the fixed traverses in so doing. The feet of the stretcher should be outside the swinging traverse, and the latter should press against the inner surface of the feet. By these means the spring hooks are all, to a certain extent, stretched toward the centre of the *Appareil*. Cases needing attention *en route* should be placed towards the centre of the train. To facilitate feeding arrangements such men as are able to get up to their meals should be kept as far as possible in the same carriages, those who must remain lying down being similarly collected together.

The Austrians advise that a covered platform should, if possible, be chosen, and kept clear of all other traffic. The worst cases should be

loaded up first and placed in the centre of the train; as regards the other cases, those who require lying down accommodation should be separate from those who can sit up, and men going to the same evacuation station should be kept together. There are no special instructions given as regards the actual manœuvre of entraining.

The Italian regulations are very complete on this point. The patients on arrival at the station are arranged in two rows, in groups of eight, or twelve, according as it is intended to load, in two or three tiers. The train privates are then told off in squads of six men each, an old soldier and a N.C.O. being added to each squad. The N.C.O. and three men take post on the platform, the others in the waggon; the former pass a stretcher to the latter, who sling it, taking care not to leave hold of the stretcher handles till they are securely engaged in the sling-loops. Upper tiers are loaded before lower, the stretchers to the right of the waggon door before those on the left, the near side before the far side. The packs of the patients are arranged on the floor of the waggon, close to the end wall and between the stretchers, either in one long row, or in pairs. The rifles are laid close along the end wall and parallel to it, the butts in the corner and the barrels resting on the packs. Each man's bread-bag and water-bottle are hung on a hook near the head of his stretcher.

The general rules for starting and running the train are throughout the four Services, *mutatis mutandis*, the same as for permanent Hospital Trains. The medical officer must take care that all the carriages are provided with the proper utensils, drinking water, etc. In the French Service he is enjoined to see that the tub provided for the soiled linen in the rearmost van is filled with disinfectant. All improvised Hospital Trains stop for the night at a rest station, the general rule being that all such patients as can get up and about are detrained for the night, helpless cases being left in the train. The pace of the French train is laid down at 15 to 19 miles an hour; that of the others is not stated, but is presumably the same as that of the ordinary military trains, which, on the Continent, is as a rule somewhat slower than this.

The professional work *en route* obviously cannot be of a continuous nature. Medical officers are enjoined to look round the train at every stop, seeing that the patients have all they want, noting how they bear the journey, and arranging that such as cannot bear further travelling are left behind.

The French direct that the shutters of the windows should be left open, and fire-proof gauze, or perforated metal, nailed over them, to prevent smoke or sparks entering; the Germans make a similar direction, but omit the important proviso that the material used should be fire-proof.

In the German and Austrian trains stoves are, when available and necessary, provided. In the French trains hot-water tins are supplied; one in each corner of the waggon is considered sufficient as a rule, but when necessary one should be placed near each stretcher, cases complaining much of cold being given hot-water bottles as well. All cracks

in the walls should be tamped with paper, tow, straw, or other materials especially in the end of the carriage towards the engine.

In the German Army special rest and refreshment stations are established along the line of rail for the purpose of dieting passengers by all Hospital Trains, other than permanent Hospital Trains. This is done under the orders of the communications authorities, in consultation with the railway staff. The station commandant tells off the necessary buildings. He is also responsible for the provision of the necessary number of attendants to carry the food to the carriages. Notice is sent in advance to all stations of the strength of the party and its probable time of arrival; notice of any delay occurring *en route* must also be sent.

In the French Service Railway Station Hospitals are provided at all important stations and junctions *(Infirmeries de gare)*. Their duties are:—

1. To provide nourishment for all sick and wounded passing through.
2. To afford emergent aid and to take over temporarily such cases as have been so far aggravated by the journey as to be unable to proceed.
3. To provide, with the assistance of the local military authorities, accommodation for sick and wounded during long halts.
4. To assist when necessary in the evacuation of cases from neighbouring hospitals.

Not being intended to afford more than temporary shelter for the sick they should be installed in the vicinity of properly-equipped hospitals to which they should transfer all such cases as are unable to proceed in the trains.

They are, as a rule, worked by the aid societies; the establishment varies with circumstances, but the following is a fair average: two medical officers, one accountant, and fifteen *infirmiers*. Additional establishment may be procured by the P.M.O. of Communications. These hospitals are established in any available railway buildings, or in tents or huts.

Each hospital should comprise:—

1. An office for the medical officer.
2. A waiting-room for sick.
3. A ward for serious cases, containing five or six beds in ordinary stations; ten or fifteen in stations which act as centres of distribution (*points de répartition*).
4. A soup kitchen.
5. A refreshment-room.

In the wards 700 cubic feet per man should be allowed. The refreshment-room may be worked under contract with the station buffet, or directly by the hospital. In order that food may be rapidly distributed to the carriages, every such hospital should be provided with the following articles, viz., 33 hampers of sufficient size to carry food for 13 men each (12 patients and one *infirmier*).

Thirty-three cans sufficiently large to hold each 13 rations of wine at least, that is 3·5 litres (equivalent to about 6 pints and 2 ounces).

These hampers and cans should be filled in advance, in accordance with the number of cases not able to get out of the train, which will have been notified by telegram. As soon as the train is signalled the station *infirmiers* place cans and hampers at equal distances along the platform, and as soon as the train stops place them in the waggons, the *infirmier* in the carriage distributing the food to the patients. One hour after the arrival of the train the *infirmiers* in the carriage should place on the platform all the hampers, cans, and other utensils. The station infirmiers then collect and remove them. The *officier d'administration* of the train gives a voucher for the number of men dieted to the accountant of the hospital, this being countersigned by the S.M.O. During the halt the *infirmiers* of the hospital remove all such cases as are unable to proceed, and take them to the ward of the hospital. Halts on these occasions should not exceed 1 hour 40 minutes, allowing in this 20 minutes for the medical officer to look round the train and see that all is correct.

In the Austrian Service rest stations (*Kranken-Haltstationen*) are established all along the line of rail. They are of two kinds, viz., rest stations with, and rest stations without, night accommodation (*Kranken-haltstationen mit*, and *Kranken-Haltstationen ohne Nachtruhe*). They are equipped by the G.O.C. Lines of Communications, or by the Ministry of War, according as they are on the Lines of Communications or in the Home Territory.

Rest stations without night accommodation are intended to afford temporary attention, food, and refreshment to sick passing through. They are established at all points on the line of rail where rationing stations (*Verköstigung-Stationen*) exist. Cases unable to bear further travelling may be detained. The establishment consists of one medical officer and four to six attendants. Civilians may be made use of. Rest stations with night accommodation are posted at despatching stations (*Abschubs-Stationen*) and at important points along the line of rail. They are, as their name implies, intended to afford more permanent shelter, etc., to parties of sick passing through. The following establishment is allowed, viz., one medical officer, 10 N.C.O.'s, and 15 men (including an instrument orderly and two cooks), and one officer's servant, from the Sanitary Corps or from the Aid Society. Two such, equipped for 200 men each, are allowed for each army corps on the Lines of Communications, apart from those in the Home Territory. They have a definite and fairly extensive equipment of drugs, surgical appliances, and clothing, and extra equipment may be procured on requisition. A station of this kind should include a large kitchen and refreshment and sleeping rooms. The cubic space allowed need not be more than 30 cubic feet per head in view of the passing nature of the occupation. Special wards for men unable to proceed, and for infectious cases, should also be provided. Previous notice should always be given these stations of the arrival of sick, so that the preparation may be made in advance.

The Italians arrange, as a rule, that the party should be fed only at the beginning and end of a day's journey. When this cannot be managed, the medical officer in charge of the train should select some intermediate station that suits the general arrangements, and inform by wire the communications authorities and the local commandant of his intention to feed the men there. He will request the latter to inform him by wire at some intermediate station whether or no his indent can be complied with. Should this resource be unavailable, he may indent on any competent supply authority for an issue of reserve rations, or, in the last resort, purchase locally, using the imprest at the disposal of the train accountant for this purpose.

As regards the transfer of patients, procedure in case of death, and so on, the rules are the same as in the case of permanent Hospital Trains.

The documents are the same for the two classes of trains, except that in the German Service no formal nominal roll is sent with the train, the patients not being looked on as forming a definite unit, as in the case of permanent Hospital Trains.

In the German, Austrian, and Italian regulations, no special directions are given for the disinfection of this class of train.

The French direct that the carriages should first be swept and sluiced with water, both inside and out. They are then either:—1. If possible exposed to the action of a jet of super-heated steam, or boiling water is sprayed into them. The corners are to be specially attended to. This method should always be preferred to any other. 2. In the case of this being impossible, solution of chloride of zinc 5 per cent., carbolic acid 5 per cent., corrosive sublimate 1 per cent., or some other disinfectant fluid should be used to thoroughly swab out the carriages.

At the end of the journey, in the German Service, as soon as all the patients have been handed over, the entire establishment returns without delay to the Sick Transport Committee which originally detailed it for the duty. All equipment which needs cleaning accompanies it, the commandant being responsible for its custody. The entire establishment will, as far as possible, be kept together as a separate unit, but the committee may detach any member or members of it, at discretion, for other work.

In the French Service it is laid down that, with a view to accelerating the return of the establishment and equipment to the advanced railway terminus (*station tête d'étapes de guerre*), the patients in a train will, as far as possible, be despatched to one or, at the most, two stations in the home territory. The stations in question will be selected by the P.M.O. at the Distributing Station *(gare point de répartition)*. The *officier d'administration* accompanying the train is responsible for all equipment which should be sent on to the district depôt (*gare de rassemblement*), and thence forwarded with the establishment as one unit to the advanced railway terminus.

The Austrians give no special instructions. It is obvious, however,

that from the purely local nature of the train, the establishment and equipment must return to the command from which they started.

In the Italian Service a *Treno Attrezato*, after having completed a journey, may at once proceed on a new trip, under the orders of the intendant, and on the recommendation of the P.M.O. of the Field Force. If not wanted immediately, the establishment comes under the orders of the communications authorities, and will as a rule be attached for duty to some hospital, a guard being detailed to look after the train and its equipment. A *Treno Attrezato* once made up is a permanent unit, with a permanent equipment, but without a permanent establishment. *Treni Provvisori* are on the completion of a journey broken up, the establishment rejoining its original post.

Ordinary Trains.

The third class of train used for the transport of the sick and wounded comprises ordinary trains, used with or without previous preparation, or adaptation, either purely for such traffic or as mixed trains. (Germany, *Krankenzüge*; France, *Trains Ordinaires*; Austria, *Gewöhnliche Züge*; Italy, *Treni Ordinari*.) These trains are as a rule used only for such cases as are able to sit up; in time of great stress, however, they may be used for the carriage of serious cases over short distances.

In the German Service they are made up of passenger carriages of the first three classes, if possible; goods vans may, however, be used, straw palliasses being supplied for the sick to lie down on. These will be specially useful if fitted with side attachments, through which poles may be passed, so that the whole palliasse may be used as a temporary stretcher. Care is enjoined in using this method that the patients are so placed as to be able to shift their position if necessary. In this manner seven or eight men may be placed in a single van. The Sick Transport Committee is responsible that these vans are properly fitted up, and for the general preparation of the train, as well as for the provision of such equipment as may be necessary. The train is made up emergently from such rolling stock as may be at hand, but carriages once told off for this work may not be diverted to other objects till the journey is completed. When a long journey has to be made, the committee is responsible that a halt is made for the night at a station where the sick can detrain and get food, etc. The station commandant is responsible for the necessary preparations being made at these stations. These rules may be taken as those followed in all Services, though in no other are the directions given so complete. It is obvious that from the purely local and temporary nature of these trains, their working and running must rest with local authorities, and depend on local conditions, the general rules that govern the working of the more completely organised trains being kept in mind.

The Germans allow two men of the Military Police to the train, and one attendant per carriage with an under-officer as commandant. These may be relieved during the journey, or accompany the train throughout.

A medical officer should always superintend the entraining of the convoy, and medical officers should in addition be detailed to meet the train at every halt. Their chief function will be to remove such cases as seem unable to continue the journey. Medical officers never accompany these trains, but the proportion of attendants may be varied at the discretion of the despatching authorities. In the Austrian and Italian Services there is practically very little difference between the working of these trains and of *Krankenzüge* or *Treni Provvisori*, as the case may be.

The following remarks may be offered on the general subject of Hospital Trains:—

As regards permanent Hospital Trains.

1. *Size.*—The German train has the great advantage of being the largest train. The advantage lies firstly in the fact that one large train does not, as regards traffic arrangements, take up as much space on the line as two trains of half the size; inasmuch as the distance between any two trains, or the intervals of time at which they are despatched, does not depend on the size of the trains, except in so far as this affects the time taken in loading. As a large train has a correspondingly large establishment, this influence is negligible. The second advantage lies in the fact that the specially fitted carriages, viz., those for the kitchen, medical officers, etc., do not need to be multiplied in direct ratio to the size of the train. The disadvantages are:—*a.* Diminished speed. The pace of military trains on the Continent is, however, in any case so slow that this influence may be neglected, except where the gradients are steep, which is the exception on the central plain of Europe. This point would, however, be one of considerable importance in India, where the steep gradients of the frontier lines, *e.g.*, the Bolan, would very seriously limit the size of Hospital Trains. *b.* The difficulty of providing sufficiently lengthy platforms for entraining and detraining. This, however, may be obviated by the erection of temporary platforms, or the use of ramps or gangways.

2. *Arrangement.*—The Germans, French, and Italians have their medical officers' carriage at the head of the train, the Austrians place theirs in the centre. The latter is indubitably the better plan, as the medical man is thus nearer to his patients, especially to the more serious cases, which should always be placed towards the centre. The kitchens in the German and French trains seem too far from the centre of the train; this causes delay in serving food to the patients, and in the French train the position of the kitchen only three from the end of the train must expose it to much oscillation, and thus impede the work of the cooks.

The main advantages of Permanent as compared with Improvised Hospital Trains are:—

1. The continuous treatment and attention that can be given to the sick during the journey.
2. The greater comfort of the sick in the matter of clothing, bedding, etc.
3. The possibility of running them through without halts for refreshment, or at night.

Their disadvantages are:—

1. Expense.
2. The fact that they can practically only be used for the single journey from front to base, and must run empty or nearly so from base to front. The Austrians indeed use their permanent Hospital Trains for the transport of dry goods (other than medical stores) to the front, and also couple on to them, when running empty, waggons containing warlike stores. This is a proceeding of very doubtful propriety. A permanent Hospital Train is a permanently protected unit, and to use any portion of it for the carriage or haulage of any but medical stores or patients, is to infringe the neutrality of the entire unit. In the case of a successful raid being made on the lines of the communications, as happened so frequently in the American Civil War, any train so used would infallibly be destroyed as it stood. It can hardly be expected that the raiders, pressed as they would be for time, would stop to discriminate between waggons that carried medical and those that carried commissariat stores, once they realised that the Red Cross covered either indifferently. Any such even apparent tampering with the principles of the Geneva Convention is much to be deprecated. It may be noted that the Indian Railways fall into the same error, carriages marked in a permanent manner with the Red Cross being used for the conveyance of troops.

The advantages of Improvised Trains are:—

1. Their cheapness.
2. The readiness with which they can be made up and prepared.
3. The fact that after use for the carriage of sick from front to base they can be utilised for any class of traffic from base to front.

Their main disadvantage lies in the fact that they must stop at certain places for the feeding and dressing of patients, and that therefore they can only run for a limited number of hours in the twenty-four, and can only start at such times as will permit of their arriving at the proper rest stations at the proper times. This inconvenience might to a certain extent be obviated by the provision of a kitchen waggon to these trains.

It need not be elaborately fitted up; a good sized kerosene or similar stove should suffice for the preparation of diets, and metal plates and utensils could be supplied for the use of the patients. The train would still have to stop to feed the passengers, but the stops could be made at any convenient station or siding, and not only at the established rest stations. On the whole it may be said that permanent Hospital Trains are admirable units for use on the rearward half or two-thirds of the Lines of Communications or in the Home Territory, but it is very doubtful whether they could ever be much used at the front, except during armistices. The experiences of the Franco-German War are too one-sided to be of real value in this respect.

The following authorities may be mentioned:—

German.—Hirschberg. "Die Bayerischen Spitalzüge im deutsch-französischen Kriege." 1872.

Zur Nieden. "Der Eisenbahntransport verwundeter und erkrankter Krieger." 1883.

Virchow. "Die erste Sanitätszug des Berliner Hilfsvereines." 1870.

Austrian.—Cron. "Der Dienst bei einem k.u.k. Eisenbahn-Sanitätszuge." 1896.

Myrdacz. "Die Thätigkeit der k.u.k. Schiffsambulanzen und Eisenbahn-Sanitätszüge im Jahre 1878-79." 1880.

Wasserfuhr. "Vier Monate auf einem Sanitätszuge." 1871.

French.—Rédard. "Transport des blessés par chemins de fer."

The Germans, French, and Austrians give instructions on these points in their Field Medical Regulations. The Austrians publish also "*Normale für Eisenbahnsanitätszüge*"; and the Italians have a special publication, the "*Regolamento pel trasporto sulle ferrovie dei feriti e malati in guerra*," of which the last edition is dated 1896.

Index to Diagrams.

Diagram I. German.—

Fig. 1. Suspension Apparatus, Hamburg System.

Fig. 2. Grund's System. Longitudinal View.

Fig. 3. Do Do. Cross Section of Carriage.

Fig. 4. Stretcher as used in Permanent Hospital Trains. Side View.

Fig. 5. Stretcher as above, in ground plan, showing the attachment for widening bed; used in three stretchers in each carriage.

(From *Kriegs-Sanitäts-Ordnung,* 1888, Bl. 2 and 4.)

Diagram II. French.[1]—

Fig. 1. *Appareil à trois étages*, with stretchers *in situ.*

Fig. 2. Bry-Ameline System in cross section; the numbers denote the order in which the stretchers are loaded.

Diagram III. Italian.—

Fig. 1. Iron hook (*Grappa ad uncino*), used for suspension in Improvised Hospital Trains.

Fig. 2. Sling used in Improvised Hospital Trains, in face.

Fig. 3. The same. Inside view.

Fig. 4. Bracket Suspension (*Montante a mensola*), used in Permanent Hospital Trains.

Fig. 5. Stretcher used in Permanent Hospital Trains (*Barella-Lettuccio*).

Fig. 6. Side view of Suspension Apparatus used in Improvised Hospital Trains, showing method of fastening supports to walls of carriage.

(From *Regolamento pel trasporto sulle ferrovie dei feriti e malati in guerra.* 1896.)

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[1] The illustrations of the French Systems are from the *Règlement sur le service de santé de l'armée en campagne.* 1895.

APPENDIX A.

Comparative statement showing composition and arrangement of Permanent Hospital Trains in the various Armies :—

	German.	French.	Italian.	Austrian.	
1	Baggage	Baggage	Baggage	Baggage	1
2	Baggage	Medical Officers	Medical and other Officers	Sick Carriage	2
3	Medical Officers	Sick Attendants	Accountant and Sick Officers	Do.	3
4	Subord. Estab.	Sick Carriage	Sick Carriage	Do.	4
5	Sick Carriage	Do.	Do.	Do.	5
6	Do.	Do.	Do.	Do.	6
7	Do.	Do.	Do.	Do.	7
8	Do.	Do.	Do.	Medical Officers	8
9	Do.	Do.	Do.	Provision Store	9
10	Do.	Do.	Do.	Kitchen Waggon	10
11	Do.	Do.	Dispensary and Provision Store	Subordinate Establishment	11
12	Do.	Surgery, Dispensary and Linen Store	Kitchen	Sick Carriage	12
13	Provision Store	Sick Carriage	Sick Carriage	Do.	13
14	Kitchen	Do.	Do.	Do.	14
15	Sick Carriage	Do.	Do.	Do.	15
16	Do.	Do.	Do.	Do.	16
17	Do.	Do.	Do.	Do.	17
18	Do.	Do.	Do.	Do.	18
19	Do.	Do.	Do.	Store Waggon	19
20	Do.	Do.	Officers' Servants		
21	Do.	Kitchen	Spare Sick Carriage	21	
22	Surgery & Dispensary	Kitchen Stores	Store Waggon	22	
23	Sick Carriage	Provision Store	Baggage	23	
24	Do.				
25	Do.	25	The above is calculated at a rate of fifteen patients per carriage ; the regulation merely lays down one half of the sick carriages in front of the dispensary and the remainder behind the kitchen.		
26	Do.	26			
27	Do.	27			
28	Do.	28			
29	Do.	29			
30	Kitchen	30			
31	Provision Store	31			
32	Sick Carriage	32			
33	Do.	33			
34	Do.	34			
35	Do.	35			
36	Do.	36			
37	Do.	37			
38	Do.	38			
39	Do.	39			
40	Subord. Estab.	40			
41	Fuel	41			

APPENDIX B.

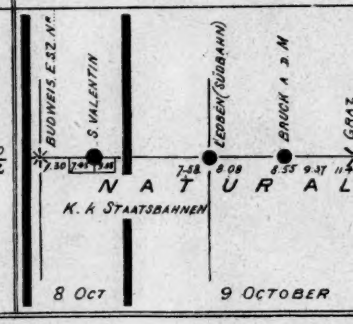
Comparative Statement showing Establishment of Permanent Hospital Trains.

Rank or Class.	German.	French.	Austrian.	Italian.
Medical Officers	1 Oberstabsarzt (S.M.O.) 3 Assistenzarzten	1 Médecin-major 1 Médecin Aide-major	1 Regimentsarzt 1 Ober-(Assistenz) arzt	1 Medico-capo. 3 Medici-assistenti
Other Officers and Officials	1 Accountant	1 Pharmacien Aide-major 1 Officier d'Administration	1 Medicamenten Accessist, for dispensary, accountant's and storekeeper's duties	1 Director 1 Chaplain 1 Military Delegate (*a*) 1 Accountant 1 Apothecary
Subordinate Establishment	16 Hospital Assistants (*a*) 16 Attendants for sick (*b*)	2 Under-Officers 3 Corporals 23 Attendants for sick (*c*)	2 Under-officers 2 Corporals 6 Lance Corporals (*d*) 15 Attendants for sick	2 Senior Superintendents 4 Superintendents, 1st cl. 4 do. 2nd cl. 24 Attendants for sick 1 Cook 1 Assistant Cook 2 Kitchen Servants 5 Officers' Servants

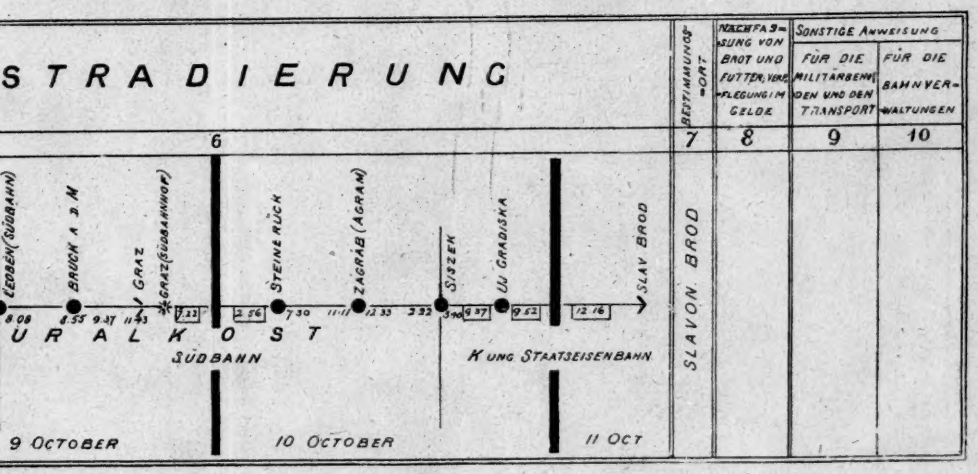
Remarks:—(*a*) Preferably a captain.
(*b*) One of each of these classes for duty in the kitchen.
(*c*) Including one clerk and cooks.
(*d*) Including two instrument orderlies *(apparat-leute)*, two cooks, and one assistant compounder.

MARSCHPLAN TRANSPORT – Nr. 308

INSTRADIRENDE STELLE	BENENNUNG DES TRANSPORTES	BELLÄUFIGER STAND							MASSNAHMEN-SCHAFTSTAG	BEMERKUNGEN
		STABSOFFIZIERE	SUBALTERN-OFFIZIERE	MANN	PFERDE	SCHLACHTVIEH	ZUGS-WAGE			
							THEILBAR	UNTHEILBAR	GÜTER	
1	2	3							4	5
K. UND K. REICHS-KRIEGS-MINISTERIUM (CENTRAL-EISENBAHN-TRANSPORTLEITUNG)	EISENBAHN-SANITÄTSZUG Nr.	–	3	28	–	–	–	–	8 OCTOBER N.	100 / 42



APPENDIX C.



ION OF ENTRAINING

ION OF DETRAINING

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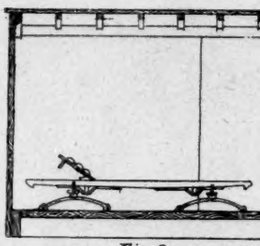
FROM MIDNIGHT TO MIDNIGHT

DARY OF RAILWAY SYSTEMS

FIG 4



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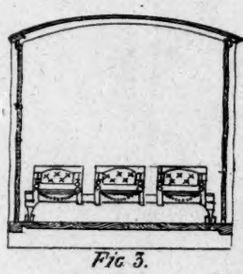
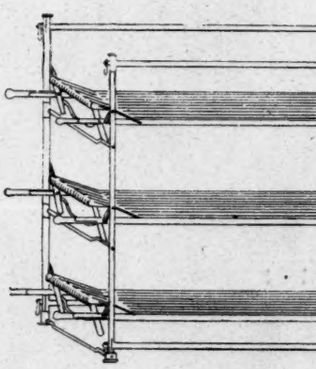


FIG. 3.

FIG 1



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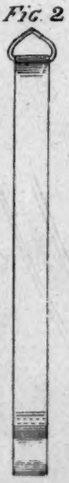


FIG 3

FIG. 1

DIAGRAM I.

G. 2.

G. 3.

Fig 4.

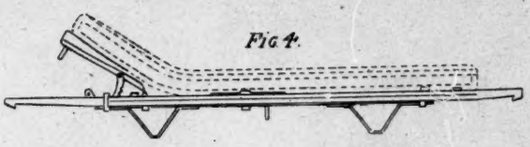


Fig 5

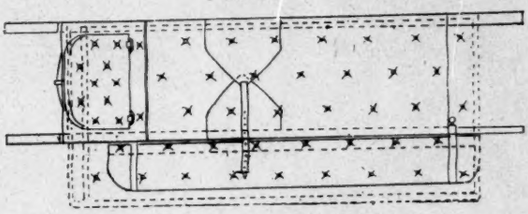


DIAGRAM II.

FIG 1

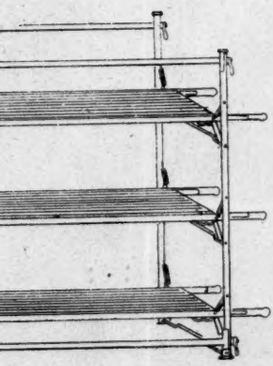


Fig 2

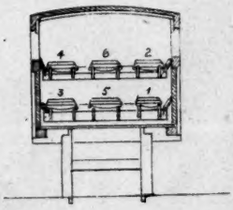


DIAGRAM III.

Fig 3

Fig 4

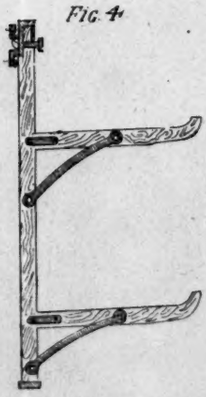


Fig. 5

Fig. 6.

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Captains—R. F. O. Foote, C.M.G., to "Hawke"; A. W. E. Prothero to "Forte"; H. L. F. Royle, D.S.O., to "Collingwood" for "Devastation"; E. S. Poë to the "Raleigh," as Commodore of the second-class in command of Training Squadron; Sir R. Poore, Bart., to "Illustrious"; Sir Baldwin Walker, C.M.G., Bart., to "Hannibal"; R. Prothero to "Doris."

Rear-Admiral Sir R. Harris, K.C.M.G., the newly-appointed Commander-in-Chief of the Cape station, will hoist his flag on board the "Doris." The second-class battle-ship "Devastation" has been commissioned to serve as tender to the "Collingwood," the First-Reserve ship at Bantry, while the latter is undergoing repairs. The second-class cruiser "Hermione" was commissioned on the 7th ult., and left on the 18th ult. for China; before leaving she had a very satisfactory three hours' trial under natural draught, with the following results:—Steam, 147 lbs.; air-pressure, ·33 of an inch; vacuum, starboard, 26 inches, port, 26·6; revolutions, starboard, 125·3, port, 126·1; I.H.P., starboard, 3,623, port, 3,784, total, 7,407; speed, 17·8 knots. The first-class belted cruiser "Orlando" has arrived at Portsmouth from Australia, on which station she has served for the last ten years as flag-ship. The new first-class battle-ships "Illustrious" and "Hannibal" have been commissioned, the first for service on the Mediterranean station, the second for the Channel; it is perhaps worthy of remark, that at the late gun trials of the "Illustrious," three rounds from each of the stern barbette guns were fired in 2 minutes 38 seconds, right astern, with the guns almost horizontal, no damage of any kind being done to deck or fittings. The first-class battle-ship "Cæsar" has been detached from the Channel to join the Mediterranean Squadron. There are some changes in the composition of the Training Squadron; the "Raleigh," which is practically a frigate, although now styled a second-class cruiser, takes the place of the "Active," as commodore's ship of the squadron; she will carry some 200 more men as her complement than the "Active," besides having the advantage of a main deck; while the third-class cruiser "Cleopatra" relieves her sister-ship the "Calypso." The third-class cruisers "Rapid," from Australia, and "Brisk," from the East Indies, have arrived home and paid off at Devonport.

The new first-class cruiser "Terrible" has commenced a series of trials, which are being carried out as follows:—A series of runs over the measured mile in Stoke's Bay at such revolutions as will give a speed of 10, 12, 14, and 16 knots, with a view to ascertaining how far the calculations, as based upon revolutions, justify the *data* as to actual speed. (This trial has been carried out.) The ship is next to have a sixty hours' preliminary trial at 12,000-H.P., to be followed by a 60 hours' run at 5,000-H.P., to test her coal consumption. She will then return to harbour to coal, and then start on a series of 72 hours' run at 10,000, 14,000, and 18,000-H.P. She will then conclude the second stage of her trials, and on her success or failure will depend the question as to whether she will continue her 72 hours' runs until she can ultimately maintain her maximum of power of 25,000-H.P. for 72 hours. Her steam pipes have been relagged in order to reduce the coal consumption by the auxiliary engines. Should all go well the trials will be completed in time for the ship to take part in the manœuvres.

The new second-class cruiser "Furious" has completed her steam trials satisfactorily. The first trial was one of 30 hours' duration to test coal consumption. It was run between the Start and the Scilly Isles, and the following were the mean results:—Steam in boilers, 225 lbs.; steam at engines, 138 lbs.; cut off in high-pressure cylinders, 27·7 starboard, and 26·2 port; vacuum, 28·4 and 27·6; revolutions, 87·9 starboard, 87·1 port; mean pressure in cylinders, high, 40·5 starboard, 33·5 port; intermediate, 15·4 and 15·6; low, 7·4 and 6·0. The I.H.P. was:—High pressure, 373 starboard, 304 port; intermediate, 371 port and starboard; low, 457 and 371, giving a total starboard pressure of 1,201, and port 1,046, and an aggregate of 2,247. The total coal consumption per I.H.P. for all purposes was 2·35, which was regarded as exceedingly satisfactory. The above results gave an average speed of slightly over 12 knots per hour. The second trial to test coal consumption at 7,000-I.H.P. was equally satisfactory, the mean results being:—Steam at engines, 210 lbs. starboard and port; cut off in high-pressure cylinders, 55 per cent. starboard, 54 port; vacuum, 27·8 and 27·6; revolutions, 127·4 starboard, 128·4 port; mean pressure in cylinders, high, 72·2 starboard, 73·3 port; intermediate, 32 and 37·4; low, forward, 15·9 and 14·4. The I.H.P. was:—High-pressure, 962 starboard, 986 port; intermediate, 1,113 and 1,312; low, forward, 1,452 and 1,330; aft, 3,527 and 3,628, making an aggregate H.P. of 7,155. The coal consumption per I.H.P. was 2·098 lbs., and the average speed per hour 18·7 knots. The third of the series of trials was for eight hours at 10,000-H.P., and the principal mean results were as follows:—Steam pressure at boilers, 256 lbs., reduced to 231 lbs. in the starboard engine and 236 in the port engine; vacuum, 28 per cent. starboard, and 27·1 port; revolutions, 139·3 starboard, 142·3 port. The I.H.P. registered was 5,178 starboard and 5,094 port, making a total of 10,272. The speed averaged 20·1 knots per hour. The coal consumption was not taken, this having been found satisfactory in the two preceding trials. The speed was a slight improvement upon that attained by the "Arrogant," a sister-ship to the "Furious," during a similar trial a few months ago.

An Admiralty circular has been issued, which states that their lordships have had under consideration the question of affording greater facilities for the selection and training of higher gunnery and torpedo ratings, and have decided upon a series of amendments to the Queen's Regulations accordingly. It has been decided to establish a gunnery and torpedo history sheet for all men who have been through these courses of instruction, and the duration of the courses of instruction have been altered so that the men in the second class will have a shorter period of study. On the other hand, duly qualified captains of gun can be promoted to the rating of leading seamen, provided they have passed in seamanship, and are otherwise considered suitable. There is to be an increase of pay to captains of turret and captains of turret gun; the terms turret and barbette being, for the purposes of the revised regulation, synonymous. New regulations are also issued affecting acting seaman gunners, the object of the Admiralty being, in the language of the circular, permanently to appropriate to either the gunnery or the torpedo branch the men who are considered best fitted for it. In making the appropriation the first points to be considered are the selection of the best shots for the gunnery branch, and putting the men who are appropriated for that branch on a level, as regards advancement in rating and extra pay, with those proceeding to the torpedo school, and also the improvement of the position of acting seaman gunners, so as to encourage the younger seamen at an early period of their career to learn the duties which will ultimately render them suitable for higher gunnery or torpedo ratings. The revised regulations provide for all examinations being noted on the gunnery and torpedo history sheet. Men who have completed their first continuous service engagements are not eligible to qualify for the rating under the revised regulation, and men who have been discharged from the gunnery school as having failed for

seaman gunner are not eligible to become acting seaman gunners for a period of two years from the date of failure; but as many men as possible of those who are eligible and who volunteer are to be put through the course, the number who can be rated and paid as acting seaman gunners being unlimited. Gunnery instructors, after they have been appropriated for such duty, are, if they are second-class petty officers, to be given the rate of first-class petty officer, provided they pass successfully at the end of their course; while instructors who are able seamen, and have passed for leading seamen, are to be rated as leading seamen. Special facilities are afforded captains of sea-going ships to give qualified gunnery instructors the rating of first-class petty officer. Captain of gun is to be considered a "higher" gunnery rating, and special rates of pay are provided for the various ratings of instructors in both gunnery and torpedo.

The new first-class cruiser "Ariadne" was floated out by the Clydebank Engineering and Shipbuilding Company, at Govan-on-Clyde, on the 22nd ult. The christening ceremony was performed by Lady Balfour of Burleigh. The dimensions of the ship are as follows:—Length, 462 feet 6 inches over all, and 435 feet between perpendiculars; her beam, extreme, is 69 feet, and her displacement 11,000 tons. The hull is of Siemens-Martin steel. There is a double bottom the full length of the machinery and boiler spaces, and, fore and aft, steel water-tight magazine flats continue the protection. Above the protective deck over the boiler spaces, and below alongside the boilers are side compartments for the stowage of coal, which, with the cross-bunkers, form as complete a protection as possible to the boilers. At the normal draught the coal capacity is 1,000 tons, but there is provision for double that quantity of fuel should the necessity for carrying it arise. The sub-division of the hull by longitudinal and transverse bulkheads is exceptionally complete. In the bulkheads, openings have been cut only where they are likely to be absolutely necessary, and the water-tight doors which have been fitted may be worked both on the spot and from the main deck. As is usual on war-ships that are sheathed, the stem, stern post, and shaft brackets are of phosphor bronze. The hull up to about 6 feet over the water-line is sheathed with teak planking, which, when the dockyard takes the vessel over, will be coppered. There are bilge keels about 210 feet long, and 3 feet deep. The rudder is a casting of phosphor bronze plated with naval brass, and may be worked either by screw steering gear, actuated by duplicate engines—one in each engine-room—or by hand. All the steering apparatus is below the protective deck, which has a thickness ranging from 4 inches amidships to 2½ inches at the ends, extends the whole length of the vessel, and covers completely the machinery, boilers, and magazines. The conning tower is of Harveyized steel, and the steering gear, shafting, voice tubes, etc., are protected as far as the protective deck by a steel tube 7 inches thick. When the vessel is completed her armament will be four 6-inch Q.F. guns with shields, two on the upper deck, aft, and two on the forecastle deck; twelve 6-inch Q.F. guns in armour casemates of Harveyized steel, eight on the main deck and four on the upper deck; fourteen 12-pounders, and a large number of smaller and machine guns. There will also be two torpedo-tubes, discharging under water, orward. The magazines and shell-rooms are of exceptionally large capacity on account of the whole of the sixteen guns which form the primary armament being of the latest quick-firing pattern, and they are situated and fitted with the object largely of facilitating the supply of ammunition to Q.F. guns. There is a complete installation of electric light, two of half-a-dozen search-light projectors being on each of the bridges, and one on each of the tops. The complement of the vessel will be about 700 officers and men, and, in addition there is accommodation for an admiral and his staff. The machinery consists of two sets of triple-expansion engines, fitted in separate water-tight compartments; each set has four inverted cylinders working on four cranks. The high-pressure cylinder is 34 inches diameter, the intermediate 55½ inches

diameter, and each of the low-pressure 64 inches diameter. All are adapted for a stroke of 4 feet. The cylinder covers are of cast steel, and the pistons, of conical shape, are also of cast steel. The high and intermediate cylinders are fitted with piston valves, and the low-pressure with treble-ported slide valves, with a relieving ring at the back, all the valves being worked by the usual double-eccentric and link-motion gear. Reversing is effected by means of double-cylinder steam engines, with gear of the all-round type, hand gear being also available. The sole-plates are of cast steel, and the cylinders are supported by cast-iron columns at the back, and forged-steel columns at the front. The crank shafts are solid, double throw and interchangeable, and, together with the thrust and propeller shafts, are of steel, and bored hollow. Each of the propellers has a boss of gun-metal, fitted with three adjustable blades of manganese bronze constructed to work inwards. The main condensers are at the back of the engines, and are of cast brass, in oval form, and fitted with brass tubes five-eighths of an inch in diameter. The condensing water is supplied by four centrifugal pumps of gun-metal, fitted with independent engines. The auxiliary condensers, one in each engine-room, are of sheet brass, with separate centrifugal pumps and engines. These condensers take all the exhaust from the small engines about the ship. The feed, fire, and bilge and hot-well pumps are all separate from and independent of the main engines, the feed pumps being arranged in the boiler-room, the others in the engine-room. Steam will be supplied by 30 water-tube boilers and economisers of the latest Belleville type. The boilers are in four groups, each group in a separate water-tight compartment. They are designed to work at a pressure of 300 lbs., reducing valves being fitted to reduce the pressure at the engines to 250 lbs. In each of the stokeholds there are air-compressing steam engines to supply air to the furnaces, the necessary air being delivered by eight large fans.

The new second-class cruiser "Hermes" was launched by the Fairfield Shipbuilding Company at Govan-on-Clyde on Thursday, 7th ult. She is one of the improved "Juno" class of vessels recently delivered to the Admiralty, two of which, the "Venus" and "Diana," were built by the Fairfield Company. The vessel launched on the 7th is one of three ordered in December, 1896, by the Admiralty, to be built in private yards. Two were secured by the Fairfield Company. The dimensions of each are:—Length, between perpendiculars, 350 feet; breadth, extreme, 54 feet; displacement, 5,600 tons. The hull is built of Siemens-Martin steel throughout, to Admiralty requirements. The vessel has a cellular bottom extending the full length of the engine and boiler spaces, and before and abaft these the water-tight flats of the magazines, etc., continue the double bottom right to the stem and stern. Under the protective deck the side compartments for the full length of the boiler space will be utilised for stowing coal. The hull is sub-divided by longitudinal and transverse bulkheads into numerous water-tight compartments, the number of water-tight doors having been reduced to a minimum and all being worked from the main deck as well as from below. The stern post, struts, and stem are of phosphor bronze. The vessel has a ram stem, and the structure behind is especially strong. As the vessel is intended for foreign service and long cruises at sea, in which the maintenance of a uniform speed is essential, the hull has been covered to above the load water-line with teak of a minimum thickness of 3½ inches, and coppered. The protection consists of a curved deck extending from stem to stern, ranging from 3 inches to 1½ inches in thickness, covering the whole of the propelling and steering machinery, boilers, magazines, etc. The reserve bunkers are on the protective deck, over the machinery space, and whilst affording a water-line belt of coal protection, they, being sub-divided into water-tight compartments, give additional security in the event of damage. An armoured conning tower of Harveyized steel is placed forward, fitted up with the usual means of navigating the vessel and directing operations while in action. The coal capacity is normally 550 tons, but provision

has been made for carrying a greater quantity if necessary. The armament consists of eleven 6-inch, eight 12-pounder Q.F. guns and a number of smaller machine guns. Two submerged torpedo-tubes, capable of working the latest pattern of torpedoes, are fitted forward. The ship has three funnels and two masts.

The propelling machinery will consist of two sets of triple-expansion engines fitted in two separate engine-rooms, each set having four inverted cylinders and four cranks. The high-pressure cylinders are 26 inches diameter, the intermediate-pressure cylinders 42 inches, and each of the four low-pressure cylinders 48 inches diameter, all adapted for a stroke of 2 feet 6 inches. The cylinders are all separate and independent castings, each fitted with a cast-iron barrel or liner and steam-jacketed. Each of the high-pressure and intermediate-pressure cylinders are fitted with piston valves, and each of the low-pressure with flat slide valves, all worked by the usual double eccentric and link-motion valve gear. The reversing engines are of the all-round type, capable of being reversed, with worm and wheel gear, all the levers being fitted with a slot and adjusting screw to allow of the expansion of steam in the cylinders being altered. The back columns are of cast-iron, fitted with separate guide faces, and the front columns are of forged steel, the engines being arranged with the starting platforms amidships. The condensers are of brass and placed at the wings, the steam being condensed outside the tubes. There are two centrifugal pumps of gun-metal, each worked by an independent engine, one in each engine-room, and arranged with a cross connection so that either or both condensers can be supplied with cooling water from either pump. The feed bilge and hotwell engines are all independent and separate from the main engines. All the exhaust steam is led into an auxiliary condenser, one being fitted in each engine room. Each condenser is fitted with a circulating pump and small air pump. The propellers are of gun-metal, each propeller having three adjustable blades. Steam is supplied by eighteen Belleville water-tube boilers of the latest type fitted with economisers, and adapted for a working pressure of 300 lbs. The boilers are arranged in three separate boiler rooms. The vessel will be fitted with the usual auxiliary machinery—a complete distilling plant to supply fresh water to the boilers, and also for drinking purposes; two sets of engines and dynamos for producing the necessary current for electric lighting; one double cylinder engine with the necessary gear for steering purposes; two complete sets of air-compressing engines and pumps with the air reservoirs for charging torpedoes; and one refrigerating machine of the cold air type, with the necessary cold chamber for the ship's provisions. The complement of men and officers will be 500.

It is contemplated that the vessel will attain a speed of 20 knots under usual conditions.—*Times* and *Naval and Military Record.*

Criticism by an amateur of an expert and his works is interesting to the writer, and sometimes amusing to the subject: the captured Tartar may, however, become an awkward recalcitrant. Mr. Hurd's article on naval design and construction, in the April number of the *Nineteenth Century*, is, in the May number, courteously but completely riddled by his erstwhile victim. Sir William White, equally with the late Mr. Isaac Walton, handles his patient as if he loved him, but Heaven's mercy is needed for the sufferer in the one case as in the other. The amateur depreciated the design of the "Renown," probably the best war-ship afloat for the purpose for which she was constructed, and appreciated the "Yashima" and "Fuji," of which the same opinion may reasonably be held. The Japanese ships are unsheathed, carry one-third less coal than the "Renown," and materially less ammunition. None of these failings are fatal weaknesses for vessels serving in the home waters, for which service they were constructed, but for prolonged sojourn in distant and tropical seas the failings might be disastrous.

ARGENTINE REPUBLIC.—The first-class armoured cruiser "San Martin," constructed by the Orlando firm at Leghorn, of 7,500 tons displacement, and 13,000-

I.H.P., has made a successful preliminary trial under natural draught, a speed of 18 knots being easily maintained; her armament differs somewhat from the first ships of this type, four 8-inch guns (two forward and two aft) being substituted for the two 10-inch guns.

The new training frigate "Presidente-General Sarmiento," built by Messrs. Laird, of Birkenhead, has made a satisfactory preliminary trial of her engines.—*Le Yacht.*

AUSTRIA-HUNGARY.—The following promotions and appointments have been made: Rear-Admiral—Johann Edler von Hinke to Vice-Admiral. Captains—Egon Graf Chorinsky and Josef Wachtel Edler von Elbenbruck to Rear-Admirals. Vice-Admiral von Hinke to be Port-Admiral and Commandant of Pola vice Admiral Max Freiherr von Pittner.—*Marine Verordnungsblatt.*

The Naval Budget for the year 1898 amounts to 10,563,060 florins (an increase of 182,000 florins over 1897) for the Ordinary, and to 3,918,200 florins (an increase of 318,000 florins over 1897) for the Extraordinary Votes. The principal items of expenditure are as follows:—Pay, etc., 5,186,270 florins; Hydrographical Department, 32,500 florins; Naval Academy, 93,090 florins; Naval Schools, 1,860 florins; Hospitals, 99,000 florins. For ships in commission, repairs, materials, and dockyards, 2,555,600 florins; third vote for torpedo-cruiser "Zenta" of 2,250 tons displacement—Ersatz "Greif," 600,000 florins (total cost, 1,500,000 florins); third vote for torpedo-cruiser (B), of 2,350 tons displacement, Ersatz "Helgoland," 410,000 florins (total cost, 1,600,000 florins); sixth vote for coast-defence battle-ship "Wien," of 5,500 tons, 90,000 florins (total cost, 3,500,000 florins); fifth vote for coast-defence battle-ship "Buda-Pest," of 5,500 tons, 940,000 florins (total cost, 3,500,000 florins); fourth vote for six torpilleurs-de-haute-mer, 310,000 florins (total cost, 1,080,000 florins); third vote for ram-cruiser "D," of 6,100 tons displacement, 940,000 florins (total cost, 3,800,000 florins).

Vice-Admiral Freiherr von Spaun, Commander-in-Chief of the Navy, has laid before the Council of Ministers a plan for the reconstruction of the fleet, for the carrying out of which an extraordinary ship-building vote of 55 million Gulden (£5,500,000) will be required, the expenditure of which he proposes to spread over 10 years; in addition there will be a yearly increase of 500,000 Gulden (£5,000) for the necessary increase of the staff and *personnel.* Should the contemplated expenditure be sanctioned, which does not however appear likely at present, by the year 1909 the Austro-Hungarian Navy would be composed of the following ships:—

15 Battle-ships of from 6,000 to 9,000 tons displacement.
7 Second-class cruisers of from 4,000 to 7,000 tons displacement.
7 Third-class ,, of from 1,500 to 2,500 tons displacement.
15 Torpedo-avisos of from 360 to 600 tons displacement.
90 Torpedo-boats and destroyers of from 360 to 600 tons displacement.

In addition, the Danube Flotilla is to be increased by three monitors and six patrol-boats. At present the fleet consists of 11 battle-ships, but only five of them are of a modern type:—3 torpedo-ram cruisers, 8 torpedo cruisers, 7 torpedo-avisos, and 61 torpedo-boats. It is intended that all the new ships shall be built in Austro-Hungarian yards, the country being now able to supply all materials for ships, including armour, while all except very heavy guns can be manufactured at the Skoda Works at Pilsen.

Vice-Admiral Spaun's proposals are identical with the views as to the necessary strength of the Austrian Navy, laid down shortly before his death by the late Admiral Tegetthoff, who considered that a fleet of 15 battle-ships, with the necessary cruisers and smaller vessels, would suffice for an effective defence of the Adriatic. It is reported, however, that the Council of State are unwilling at

present to sanction an expenditure of more than half of the sum demanded by the Minister of Marine.

The naval manœuvres in the Adriatic will begin in May, and will last for 3 months; the ships exercising by themselves singly at first, and then as a squadron, concluding with operations, the details of which have not as yet been settled.—*Militär-Zeitung* and *Mittheilungen aus dem Gebiete des Seewesens.*

The new coast-defence ironclad "Buda-Pest" (see frontispiece) has recently completed a successful series of official steam trials at Pola.

The Austrian Navy now possesses three coast-defence ironclads—namely, the "Wien," "Monarch," and "Buda-Pest." These vessels have been constructed from the designs of Herr Oberingenieur Siegfried Popper, of the Austrian Navy, and are in every respect similar, except in the boiler installation. The "Wien" and "Monarch" are fitted with cylindrical boilers, and although it was originally intended that the "Buda-Pest" should have cylindrical boilers, the boiler-rooms being constructed for their reception, it was ultimately decided by the Austrian Government to substitute the water-tube type. Consequently Belleville boilers were fitted in the boiler-rooms originally intended for cylindrical boilers, and the two systems are therefore working under precisely similar conditions with regard to space occupied in the ship.

The trials are especially interesting because, so far as we are aware, it is the first occasion upon which vessels identically similar in every respect, excepting the boilers, have been tried practically side by side, thereby affording an opportunity for just comparison of the merits of the two types. All three vessels were tried at Pola, each loaded to the same displacement and run over the same course, the trials being under the observation of the same Austrian naval officers forming the commission representing the Government.

The principal dimensions of the vessels are as follows:—Length, 305 feet; beam, 55 feet 9 inches; draught, 21 feet; displacement, 5,550 tons; armour, belt, 10·6 inches; barbette, 10·6 inches; protective deck, 2·36 feet.

The armament consists of:—Four Krupp 9·4-inch, six Q.F. 5·9-inch, fifteen Q.F. 3-pounders, and two machine guns, with two torpedo-tubes.

The machinery consists of two sets of triple-expansion engines having cylinders:—H.P. 33⅓ inches; I.P., 51 inches; L.P., 78¾ inches; stroke, 35½ inches, steam being supplied in the case of the "Wien" and "Monarch" by cylindrical return-tube boilers having a total heating surface of 15,750 square feet, and grate area of 568 square feet, and in the "Buda-Pest" by Belleville water-tube boilers having a total heating surface of 22,500 square feet, and grate area of 720 square feet. The propellers of the three vessels were of the same diameter and surface, pitch being 15 feet 6 inches in the case of the "Wien" and "Buda-Pest," altered to 15 feet 3 inches in the case of the "Monarch."

Appended we give comparative results of the natural and forced-draught trials of the three vessels:—

Natural-Draught Trial of Six Hours' Duration.

——	"Wien."	"Monarch."	"Buda-Pest"
Mean number of revolutions	121·7	119·6	124
Mean I.H.P.	6,376	6,110	6,608
Mean steam pressure in boilers (lb. per square inch)	138	130	230
Ditto at engines	132	121	129
Vacuum	26·4	27	27·9
Mean air pressure	·63	·6	nil
Mean speed of ship	16·7	16·2	17·1

Full Power Forced-Draught Trial of Four Hours Duration (during two hours of which the vessel steamed over a measured course 17 knots, accurate observations being taken as to power, speed, etc.).

—	"Wien."	"Monarch."	"Buda-Pest"
Mean revolutions	131·2	135·76	135·6
Mean H.P.	8,480	8,900	9,185
Mean steam pressure in boilers (lb. per square inch)	149	145	199
Ditto at engines	142	131	149
Vacuum	25·5	25·5	26·4
Mean speed in knots	17·49	17·35	17·87
Number of stokehold ventilating fans ...	8	8	4
Mean air pressure	1¼	1¾	·2

The stokers were drawn entirely from the Austrian Navy. The coal used was Nixon's navigation, and, being measured in the case of the natural-draught trial of the "Buda-Pest," the consumption was ascertained to be about 1·8 lb. per I.H.P. Thermometers were placed in various parts of the engine and boiler rooms, between decks, and in the cabins, the temperature registered during the trial being carefully noted, and it was found that the temperature in all parts of the ship was much lower in the case of the "Buda-Pest" than her sister-vessels. The representatives of the Austrian Government considered the results of the trials as highly satisfactory, both engines and boilers working smoothly throughout. It will be observed that the adoption of Belleville water-tube boilers rendered possible such a large increase of heating and grate surface when fitted in the same space as the cylindrical boilers that a higher power and speed could be realised under practically natural-draught conditions than could be obtained with the cylindrical boiler under forced draught with considerable air pressure. The ship was in charge of Captain Carl Edler von Adamović, the Austrian Government being represented by a commission of which Captain Wilhelm von Mörth was the president; the engineer-in-chief of the Austrian Navy, Herr Jacob Fassel, and the director of the dockyard, Herr Wenzel Muller, also watched the trials on behalf of the Government. Herr Gustav Lendecke was in charge of the trials on behalf of the Stabilimento Tecnico Triestino, of Trieste, constructors of the vessels and engines; Messrs. Maudslay, Sons, and Field, who were responsible for the boiler installation, being represented by Mr. John Sampson.

It has been decided to fit Belleville boilers in the new armoured vessels which are building for the Austrian Navy.—*Times.*

FRANCE.—The following are the principal appointments which have been made: Capitaines de frégate—C. E. Motet to "Pascal"; De Saint-Victor de Saint-Blancard to Command of fixed defences of Lorient; D. M. Bonifay to "Estaing"; R. V. Winter to "Lavoisier."—*Le Journal Officiel de la Republique Française.*

The period of service of Rear-Admiral Pottier in command of the 2nd Division of the Active Squadron of the Mediterranean Fleet, which in the ordinary course expired on the 6th inst., has been extended pending the settlement of affairs in Crete.

The new second-class cruiser "Catinat," having successfully completed her preliminary trials, has commenced her official ones; during the six hours' natural-draught trial, the engines developed 8,044-I.H.P., with the screws making 123 revolutions, which gave a mean speed of 18·3 knots measured on the mile, while the coal consumption was 697 grammes per I.H.P., per hour; at her four hours' trial under

forced draught, the engines developed 9,938-I.H.P. (938-H.P. over the contract), with the screws making 132·5 revolutions, giving a speed of 19·6 knots on the measured mile, while the coal consumption was 795 grammes per I.H.P. per hour; during a twenty-four hours' run under natural-draught the engines developed 6,455-I.H.P., with the screws making 115 revolutions, the mean speed being 17·4 knots, while the coal consumption was 692 grammes per I.H.P per hour, which it is calculated would allow her to steam for seven days at that speed; the ship will now be completed with all speed for sea. The new first-class battle-ship "Charlemagne" has completed the preliminary trials of her engines off Brest; she is yet a long way from completion, the turrets for her heavy guns not having yet been erected; her draught of water during the trials is not stated, but the probabilities all point to the ship being very light; at her first trial, the engines developed 5,400-I.H.P., the screws making 95 revolutions, which gave a speed of 14·3 knots, with a coal consumption of 710 grammes per H.P. per hour; at the second trial with the engines developing 9,000-I.H.P., with natural draught, a mean speed of 16·5 knots was maintained, while on one run on the measured mile 17 knots was recorded; at this speed the ship seems to have cut easily through the water without throwing up a large wave detrimental to the speed, as is done by the ships of the "Masséna" type; at the final trial under forced draught, the engines developed 14,300-I.H.P., which gave a maximum speed of 18 knots and a mean of 17·7 knots for the four hours; the first official trial took place a few days later, only the central screw was used, 1,500-I.H.P. was developed, with 79 revolutions, giving a speed of 8·3 knots, the coal consumption being 680 grammes per H.P. per hour. It is hoped that the new first-class battle-ship "Jéna" will be sufficiently advanced to be ready for launching in September next, when another first-class battle-ship of 12,700 tons displacement, to be called the "Suffren," will be laid down on the vacated slip.

The first-class battle-ship "Amiral-Baudin," which has been undergoing extensive modifications and repairs, has been commissioned with a reduced complement for her trials. The new third-class cruiser "Lavoisier" has maintained a mean speed of 21·5 knots during her four hours' full-speed trial, and a mean speed of 18·6 knots during a twenty-four hours' run at full speed under natural draught, the engines developing 4,580-I.H.P., with a coal consumption of 750 grammes per H.P. per hour. The military masts of the second-class cruiser "Suchet" are being removed and will be replaced by a couple of pole masts. The launch of the new commerce-destroyer "Châteaurenault," which should have taken place on the 24th March from the La Seyne Yard, near Toulon, has been delayed by the strike among the workmen of the firm, and it is quite uncertain now when she will take the water. The first-class armoured cruiser "Latouche-Tréville," which was to have been relieved in the Active Squadron of the Mediterranean Fleet by the new second-class cruiser "D'Assas," and been paid off into the 2nd Category of the Reserve, is now to remain in commission, and the "D'Assas," until further orders, will be attached with a reduced complement to the Reserve Division of the squadron.

A new gun-boat of an improved "Surprise" type is to be commenced at Rochefort, and will be called the "La Zélée"; her hull will be of hard steel, sheathed and coppered, and as she is intended for foreign service she will have three masts and be spare-rigged forward. Her dimensions will be as follows:—Length, 185 feet; beam, 26 feet; mean draught, 9 feet 10 inches on a displacement of 646 tons. She will have Niclausse water-tube boilers, with engines of 900-I.H.P., giving her a speed of 13 knots; the coal supply will be 75 tons, which will give her a radius of action of 2,700 miles at 10 knots, and 1,000 miles at full speed; she will be armed with two 10-centimetre (3·9-inch) Q.F. guns, four 6-pounder Q.F., and four 1-pounder Q.F. guns.

The new first-class cruiser "D'Entrecasteaux," 8,114 tons and 13,500-I.H.P., has been continuing her preliminary trials off Toulon. With the engines developing

9,800-I.H.P., and making 95 revolutions, a speed of 17·8 knots was obtained, although the weather was bad and the sea rough. On her natural-draught trial however on 29th ult. the starboard forward boiler gave out, and there was an escape of steam, severely scalding three stokers. The trial was at once stopped. No cause is assigned for the accident.

On 24th March the old aviso "Pétrel," launched in 1861, was towed six miles south of Toulon, to act as a target for four battle-ships of the Mediterranean Fleet, viz., the "Brennus," "Carnot," "Jauréguiberry," and "Marceau." The ships having cleared for action, steamed past the target at a speed of 12 knots and distance of 2,500 yards and opened fire. Almost the first shot cut away the "Pétrel's" mizzen-mast, and she was soon afterwards struck in the afterpart of the hull and began to fill and sink stern first and eventually went down. From the "commence fire" to the time the "Pétrel" foundered about half-an-hour elapsed.

A new station of the mobile defence has been established at Saint-Servan under the command of the lieutenant commanding the "Alarme" sea-going torpedo-boat now stationed at Granville. It will consist of six torpedo-boats besides the "Alarme" to be sent from Brest.—*Le Yacht* and *Le Temps*.

RUSSIA.—The finding of the court-martial on the loss of the "Gangut" is:—1. That while going at a speed of 2½ knots, she struck on a rock 22½ feet below water not marked on the chart, but at a depth where it might have been discovered, and received injuries under water 2. That the said injuries did not necessarily entail the loss of the ship. 3. That such loss was caused by the injury, together with constructive defects, owing to insufficient care on the part of the builders, and the fact that the ship was at the time without half its boilers. 4. That the water-tight main deck was, owing to defective construction, only 1 foot above water, and the leakage thus soon brought it below the water level, and the water-tight doors only reached as high as the main deck; and 5. That the small diameter of the tubes diminished the power of expelling the water, and the water-tight doors were weak and imperfectly fitted. The captain is blamed in a general way for not trying to remedy and not reporting these defects.

An interesting lecture was given at the Naval Institution, Cronstadt, on the 23rd March, on The Political and Strategical Conditions of the Battle of Chesmé (1770):—"In 1768 the Baltic Fleet only counted 14 sail of the line, which were so ill-constructed and leaked so badly that after a gale they could not be pumped dry. So much so was this the case, that the English thought it Quixotic to put to sea in such ships. As regards armament, there was neither system nor method. They had guns of all patterns and calibres, from ½ lb. upwards by units to 30-pounders, estimated by the weight of spherical shot, though all sorts of projectiles were used, even stone shot. It is easy to understand what confusion this must have lead to in action. The guns were badly cast, badly kept, and carelessly tested. Thus of 130 turned out in 1768 at the Siberian foundries, only 17 were fit for service; and out of 100 kept in reserve in one of the St. Petersburg arsenals, only three proved fit to use; the others were not strong enough even for saluting purposes. The crews were not properly exercised at sea, and cruises never exceeded the limits of our possessions in the Baltic, except when ships were brought round from Archangel, when first built. The want of instruction of our officers of that day in technical and scientific matters could not be made up for by practical experience, however great, and they got no practice. Thus we had no skilful admirals and scarcely any good captains, and had to have recourse to Dutchmen, Englishmen, or Frenchmen."

Among the theses put forward for discussion at a meeting of the students of the Naval College, we find the following:—1. The only order of battle advisable is line ahead. 2. Complicated manœuvres cannot be allowed in battle. The first condition of all manœuvres is simplicity and the absence of complicated signals. 3. Only such measures of concentration against an enemy are of

practical use as are so calculated that the enemy cannot foresee them till the last moment, and so cannot anticipate or frustrate them. Inactivity on his part must never be reckoned on.

In connection with the proposed expenditure of 90,000,000 roubles in augmenting the fleet, the *Nedielia* has the following, headed "The Needs of the Navy" :—"We first of all naturally turn our eyes to improvements that might be made in the *personnel*. By the new regulations, those who wish to join the Navy must be between the ages of 12 and 14 on entering the lowest class, and only be promoted to midshipmen after a six years' course, or have passed out of some higher educational establishment—a university, for instance, or a normal schoo or lyceum, enter as cadet, serve the necessary time at sea, and then pass a professional examination for midshipman. In the first instance, 12 to 14 is too early for boys to decide finally on their choice of the Navy as a profession; and, in the second, young men of from 22 to 24, or more, after passing through a higher educational institution, are too old to begin their acquaintance with sea life and its amenities. Would not the golden mean be preferable? In the sixties young fellows of from 14 to 17 were taken. The means for increasing the number of officers are as follows :—1. Let them be allowed to enter by examination any of the six classes, those who go into the highest being promoted midshipmen on completing the necessary amount of sea service as probationers. 2. Let those who have passed with credit out of Real-Schulen, Gymnasien, or the Naval Academy, be admitted to the Fourth Class without examination. The old plan of having two junior classes for general subjects, the four higher being reserved for special teaching, might be resumed."

With a view to remedying the deficiencies in the light thrown on elevating screws and sights of a fragile nature, and the falling out of the glass globes when the guns are fired, experiments have been carried out with an improved apparatus with screwed luminous tops and small screwed incandescent lights. These having proved very superior to those in use, will be for the future supplied to all ships for night-firing; but those in use will not be replaced till worn out.

The trials of the three new boilers supplied by Hawthorn, Leslie and Co. to the torpedo-cruiser "Capitan Saken" gave the following results :—Amount of water condensed in an hour: Foremost, 21,658 lbs.; amidships, 23,866 lbs.; after, 25,284 lbs.; total average, 23,602·7; or 20 per cent. more than the contract amount (19,383½ lbs.). The water supply was heated by steam from a separate locomotive, its mean temperature being about 70° C., owing to the frost. The tubes were tried at a hydraulic pressure of 320 lbs. The pressure of air on the ventilators equalled 1¼ inches, and they made 300 revolutions.

A commercial harbour is to be constructed and a settlement built at Ekaterino Haven at an expense of 250,000 roubles, the Executive Department being transferred there.

Some new ships are to be added to the flotillas in the Siberian rivers, more especially the Yenissei.

The contract for the armour for the two new battle-ships "Peresviet" and "Osliabia," building at the Baltic and New Admiralty Yard, St. Petersburg, respectively, has been secured by the Carnegie Steel Company, Pittsburg, United States. The following firms tendered at the rates given below :—Price per ton—Vickers and Co., 583·96 dollars; John Brown and Co., 569·38 dollars; St. Chamond, 490 dollars for 228-millimetre thick plates, 569 dollars for 126-millimetre plates, and 548 dollars for 101-millimetre plates; Chatillon, 486 dollars for 228-millimetre, 496 dollars for 203-millimetre, 517 dollars for 178-millimetre, and 563·5 dollars for 126 and 101-millimetre plates; Marrel Frères, 530·7 dollars for 153-millimetre and 382·14 dollars for 101-millimetre plates; Krupp, 562·5 dollars for plates of any thickness; Dillingen, 559·3 dollars also for plates of any thickness; Witkowitz, 452·2 dollars for plates of any thickness; the Bethlehem Iron Com-

pany, 530·45 dollars, and the Carnegie Steel Company the same sum for plates of any thickness. The Government at first rejected all the tenders as being too high, but finally accepted an offer from the Carnegie Company, on their agreeing to supply the armour at 500 dollars a ton. It is hoped that the "Peresviet" and the "Osliabia" will be launched towards the autumn of this year.

Four different systems for the employment of petroleum fuel are to be tried on board the coast-defence monitor "Admiral Greig." The new second-class cruiser "Svetlana" which has been built at Havre for the Russian Navy has left that port for the Mediterranean.

It has been decided to build three first-class battle-ships on the Neva, 12,675 tons each, of the new type of the sister-ships "Osliabia" and "Peresviet," now under construction. They will be laid down on the slips at present occupied by the two last-named vessels, which, as has been stated above, are to be launched this autumn, the one from the Baltic Works and the other from the New Admiralty, and on the slip which will become vacant very shortly by the launch of the new cruiser "Pallada," 6,630 tons. There will then still be on the slips at St. Petersburg, the improved "Rossia" called the "Gromoboi," 12,196 tons, at the Baltic Works, and the two sister-ships of the "Pallada," named respectively "Diana" and "Aurora," at the Admiralty Yard and the Galerny Island. The battle-ship "Poltava," 10,960 tons, engined by Humphrys, Tennant, and Co., will have her trials this summer, and possibly also her sister-ship the "Sevastopol"; while the third of this class, the "Petropavlovsk," though tried last autumn, is actually further from completion than the "Poltava." All these three vessels were laid down early in 1892, so that they will have been over six years under construction At Nikolaieff on the Black Sea the "Kniaz Potemkin Tavricheski" has recently been laid down. She will be a sister-ship to the first-class battle-ship "Tri Sviatitelia," and it is intended to order a swift light-armoured cruiser, 8,000 tons, from the new Belgian Company at the same port.

Of smaller vessels, twelve torpedo-boat destroyers of the "Sokol" type are under construction at the Admiralty Works, at Ijora, and at the Nevsky Mechanical Works, and various minor vessels are in hand or in contemplation. The twelve torpedo-boat destroyers are destined for Vladivostok and Port Arthur. The coast-defence ironclad "General-Admiral Apraxin," 4,126 tons, a copy of the "Admiral Seniavin" and "Admiral Ushakoff," is undergoing completion at Neva, and the same is the case with the battle-ship "Rostislav," 8,800 tons, at Sevastopol. The Baltic Works will also shortly begin the construction of a small vessel of 2,500 tons, together with her engines of 5,000-H.P., for laying down or protecting submarine mines. It is further stated that two or three more large battle-ships of about 13,000 tons, armed with 12-inch guns, and a number of torpedo-boat destroyers on the English model are to be built by Cramp in the United States.

The three battle-ships to be laid down this year in St. Petersburg are to be armed with four improved 10-inch guns of 40 calibres, and their bottoms will not be sheathed with the usual wood and copper, as they are intended for service in the Baltic; this will produce a saving of about £30,000 sterling on each vessel. At the same time the Admiralty has offered a competition prize for the best composition for coating the bottoms of war-ships, and experiments are at present being made in tropical waters with some out of a hundred different kinds delivered up to the end of February last.

At present there are building and completing in Russia and abroad altogether six first-class battle-ships, one second-class, one coast-defence ironclad, one first-class armoured cruiser, three second-class protected cruisers, three gun-boats, about seventeen torpedo-boat destroyers, and nine or ten torpedo-boats.—*Kronstädtski Viéstnik* and *Mittheilungen aus dem Gebiete des Seewesens.*

UNITED STATES.—The two new first-class battle-ships "Kearsarge" and "Kentucky" were launched on the 24th March, in the forenoon, at Newport News.

The two ships were built on opposite sides of a powerful travelling construction derrick, on ways specially prepared for them. They will be exactly identical and will form the most powerful pair of battle-ships in the Navy.

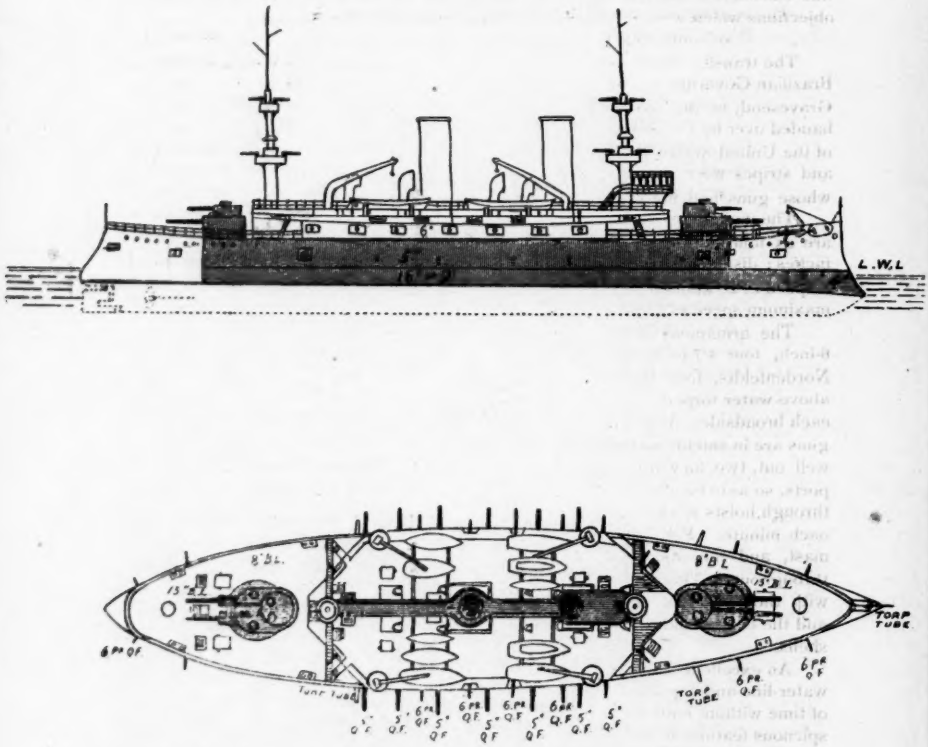
The leading features of the two ships are as follows :—

Water-line length	368 feet.
Beam	72 feet 2½ inches.
Draught	23 ,, 6 ,,
Freeboard forward	14 ,, 3 ,,
,, aft	13 ,, 3 ,,
Displacement	11,525 tons.
Speed	16 knots.
Coal supply	410 tons.
H.P.	10,000
Armour nickel steel.	
Water-line belt	16½ inches.
Side armour above belt	6 ,,
Turret armour	17 and 15 ,,
Barbette armour	15 ,,
Conning tower	10 ,,
Protective deck	2¾ ,,
Armament :	
Main battery	Four 13-inch guns.
Sub-main battery	Four 8-inch ,,
Secondary battery	Fourteen 5-inch R.F. ,, / Twenty 6-pounder R.F. ,,

If compared with the "Indiana" type it will be evident that the greatest change in the "Kentucky" and her sister is in the novel method adopted for carrying the 8-inch guns. In the "Indiana" there were eight of these disposed in four turrets, at the four corners of the central armoured battery. By this arrangement it was hoped to be able to train four guns on either beam or directly ahead. In the gunnery trials, however, it was found that if these guns were fired direct ahead or astern, their blast rendered the sighting hoods of the 13-inch guns untenable. To prevent this "interference," as it is called, double-deck turrets were adopted. They constitute the most striking feature in these ships; nothing like it has ever been attempted before, and it is not likely that it ever will be again. As far as the danger of interference is concerned, the device is likely to prove a success. The muzzles of the 8-inch guns project well beyond the sighting-hoods of the 13-inch gun turret below it, and no serious effects will probably be felt by the man stationed within them. It will be noticed, moreover, that the "Kentucky" will be able to bring the same number of 8-inch guns to bear in any direction as the "Indiana," that is, two ahead or astern, and four on either beam; in fact, owing to the inability of the 8-inch guns of the "Indiana" to be fired dead ahead or dead astern, the four 8-inch guns of the "Kentucky" may be said to be more efficient than the eight similar guns of the "Indiana." The great weight of two turrets and four guns with their ammunition is thus saved and can be put to other uses.

Next to the turrets the most novel feature in these ships is the powerful broadside battery of fourteen 5-inch rapid-fire guns which it has been possible to substitute for the four 8-inch guns and turrets and the four slow-firing 6-inch guns of the "Indiana." This battery is shown in the engraving ranged within a central battery on the main deck between the two turrets. There are seven guns on each broadside, each gun firing through an arc of 90°. Though the shell for

the 5-inch gun weighs only 50 lbs. as against 250 lbs. for the shell of the 8-inch gun, so great is the rapidity of fire from the former gun that three times the weight of metal will be thrown in a given time from the rapid-fire battery. The gunners will be protected by 6-inch Harveyized steel. On the deck above will be another battery of twelve 6-pounder guns, and eight others will be



PROFILE AND DECK PLANS OF NEW UNITED STATES FIRST-CLASS BATTLE-SHIPS "KEARSARGE" AND "KENTUCKY."

located forward and aft on the berth deck. It will be the work of these guns to repel the attack of the torpedo-boats. A number of 1-pounders and Gatlings will be carried in the tops of the military masts for the purpose of sweeping the decks and other exposed portions of the enemy.

We have said that it is not likely that any more double-deck turrets will be built. The reason for this is the objection which naval designers feel to putting "too many eggs into one basket." It is an accepted axiom in war-ship design that the various gun stations of a ship should be as widely separated as possible, with a view to localising the damage inflicted by a successful shot.

If the lower half of a double-deck turret should be crippled, the upper turret would also be placed *hors de combat*, and a light shell which was incapable of penetrating the 15-inch armour of the lower turret might pass through the 9-inch armour of the upper turret and wreck the turning gear below, thereby dis-

abling four guns. There is a further objection urged by the gunners in the fact that the two sets of guns must be trained together, whereas it might frequently be desirable in the course of a fight to train the 13-inch guns upon one part of the enemy and the lighter guns upon some other part. The whole question, however, was well thrashed out by the experts at the time the ships were designed, and it was considered that the economy in weight and machinery more than off-set the objections which were raised against the system.—*Scientific American.*

The transfer of the new cruiser "Amazonas," lately built at Elswick for the Brazilian Government, but sold by the latter to the United States, took place at Gravesend, at the mouth of the Thames, England, when the ship was formally handed over by Commander Corres, of the Brazilian Navy, to Lieutenant Colwell, of the United States Navy. The Brazilian flag was hauled down and the stars and stripes were run up, accompanied by a salute from the old fort at Tilbury, whose guns had not spoken for two centuries past.

The main dimensions, etc., of the "New Orleans, as she has now been called, are as follows:—Length, 330 feet; beam, 43 feet 9 inches; draught, 16 feet 10 inches; displacement, 3,600 tons. She is driven by twin engines of 7,500-H.P. at a speed of 20 knots under natural draught. Under forced draught she attained a maximum speed of 21·05 knots per hour.

The armament is very powerful for the size of the ship. It consists of six 6-inch, four 4·7-inch, and ten 2·24-inch rapid-fire guns, besides four 1-pounder Nordenfeldts, four Maxims, and two field guns for landing operations. Three above-water torpedo-tubes are fitted, of which one fires right ahead, and one on each broadside. A very heavy fore and aft fire can be obtained, as two of the 6-inch guns are in shields on the poop and forecastle, and the other four are sponsoned well out, two forward and two aft. The 4·7-inch guns are carried in recessed ports, so as to be clear of the fire of the larger pieces. The ammunition is supplied through hoists worked by electric motors, and seven rounds a gun can be fired each minute. Four electric search-lights are fitted, one on a platform on each mast, and the others on deck. The ship is, of course, electrically lighted throughout. There is a turtle-back steel armour deck 3 inches thick, which, with the 6 or 8 feet of coal stowed in the space between the ship's outer skin and the curved sides of the deck ought to serve to keep out all except heavy shells.

An excellent feature of this vessel is that she is sheathed with wood below the water-line and coppered. This will enable her to remain afloat for a great length of time without entering dry dock to be cleaned. The military masts are a conspicuous feature of the ship on account of their size and the double tops which they carry. In these tops will be located the deadly Maxims and Nordenfeldts, whose duty it will be to repel torpedo attack and sweep the decks and exposed gun positions of the enemy.—*Scientific American.*

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS DURING APRIL, 1898.

Lieut.-General W. P. Tomkins, C.I.E., Royal (late Bengal) Engineers, to be General; Major-Generals G. E. L. S. Sanford, C.B., C.S.I., R.E., Sir Francis W. Grenfell, G.C.M.G., K.C.B., and P. S. Lord Methuen, K.C.V.O., C.B., C.M.G., to be Lieut.-Generals; Colonels (temp. Major-General) F. T. Lloyd, C.B., R.A., Sir H. E. Colvile, K.C.M.G., C.B., T. Fraser, C.B., C.M.G., R.E. (temp Major-General), W. V. Brownlow, C.B., and E. S. Brock, to be Major-Generals. General Sir E. G. Bulwer, K.C.B., to be Colonel of the Royal Welsh Fusiliers; Major-General C. J. Burnett, C.B., to act as Qr.-Mr.-General to the Forces;

Brevet Colonel E. L. Elliot, C.B., D.S.O., Indian Staff Corps, to be Inspector-General of Cavalry in India, with the temporary rank of Major-General; Colonel I. S. M. Hamilton, C.B., D.S.O., to be Commandant School of Musketry, Hythe; Colonel P. D. Jeffreys, C.B., to command a 2nd Class district in India, with the temporary rank of Brigadier-General; Colonel J. H. Wodehouse, C.B., R.A., to command a 2nd Class District in India, with the temporary rank of Brigadier-General; Colonel J. T. Coke, from D.A.G., Aldershot, to command the troops in the Mauritius, with the temporary rank of Major-General; Colonel R. H. L. Brickenden, the Black Watch, to command the 42nd Regimental District.

HOME.—An Order in Council will shortly be issued, under the Military Manœuvres Act of 1897, whereby about half the county of Wiltshire and the whole of Dorsetshire—roughly about 1,250 square miles—will in the months of August and September next be at the disposal of the Commander-in-Chief for the purpose of Military Manœuvres. The county of Wilts will be intersected by a line running East and West slightly to the South of Devizes. From this line southward the entire extent of the county will be available, including Salisbury Plain, which is now the property of the Government, and the whole of Dorset to the English Channel. From North to South the distance is just 50 miles, and in width the area averages just half that number. The general scheme of operations is that under General H.R.H. the Duke of Connaught a Northern Army Corps shall assemble at Aldershot, and from there march to Salisbury Plain to repel a Southern Army Corps, which, under General Sir Redvers Buller, will have landed on the coast, and is in process of concentration in the vicinity of Dorchester. That there may be some co-operation between the land and naval forces is more than possible, for the reason that a considerable number of the troops which will form the Southern Army Corps will have to be brought by sea from Ireland.

The Military Manœuvres Act, under which facilities for the coming operations are to be obtained, provides adequate compensation for all damage that may be sustained by landowners or occupiers by the passage of troops through their possessions or holdings. The operation of the Act is limited to the period the Order in Council may prescribe, and it is set in motion in the following manner:—Three months before the commencement of the period proposed to be prescribed it is necessary for the Military advisers of the Crown to prepare and forward to the County Council of every administrative county, wholly or partly within the limits of the area proposed to be prescribed, a draft of the order, which is to be publicly advertised. If within thirty days after the publication of the notice any petition is presented to the County Council of any of the counties affected by the proposed order against the proposal to make the order, the draft order must be laid before each of the Houses of Parliament for not less than thirty days, and if either House, before the expiration of the thirty days during which the draft has been before it, presents an address to her Majesty against it, no further proceedings may be taken thereon. In the event of no petition being presented, or no Address adverse to the proposed order being adopted, her Majesty in Council may make the order. In the present case no motion has been made in either House, and the order will be made in due course.

Within the limits laid down by the Order in Council and during the period prescribed the forces may, with their arms, munitions of war, and stores, pass over and execute Military Manœuvres on any unenclosed and any authorised enclosed land, whether public or private, encamp and dig trenches, and throw up temporary field works thereon. They may supply themselves with water from any authorised sources, and also for the same purposes dam up any running water. The forces are not, however, empowered to enter on or interfere with any dwelling-house, farmyard, garden, orchard, nursery ground or park enclosed within the curtilage of any dwelling-house. In the compensation clauses of the Act provision is made for the establishment, where necessary, of an Arbitration Commission, in which the military authorities, the person seeking compensation, and the County

Councils are represented, and also for the calling in, if need be, of an umpire appointed by the Board of Agriculture. The Salisbury Plain area will be occupied from June 15th by a large cavalry force under Major-General Sir George Luck, K.C.B., Inspector-General of Cavalry, preliminary to the Grand Manœuvres, which will commence in August. Between seventy-five thousand and eighty thousand troops will be engaged.

In so far as military manœuvres in this country are concerned, the Military Manœuvres Act of 1897, marks a new era. During the Peninsular War some of our embodied Militia battalions took part occasionally in very useful exercises. The next attempt at "exercises" was during the camp at Chobham in 1852, when they were arranged chiefly for the benefit of the general officers. But actual autumn manœuvres in Great Britain are a foreign importation; to Prussia the credit is due of establishing peace manœuvres. Frederick William I. was the founder of the military strength of Prussia, and he left his successor the legacy of an army which was only wanting in tactical skill and intellectual training of its generals to make it perfection. Frederick II. then developed on the manœuvre-fields of Potsdam, Spandau, and Berlin, the Prussian tactics of the last century. Even recent years have not seen such constant, closely connected, and numerous manœuvres as took place from the year 1745 to the year 1756.[1] The manœuvres at Spandau in 1753 lasted twelve days, 49 battalions and 61 squadrons, amounting altogether to 36,000 men being assembled together for the purpose of taking part in them. The King laid the greatest stress on them, and took immense pains to turn the experiences gained in the first two campaigns in Silesia to account. At the Prussian manœuvres before the Seven Years' War, no one could be present, not even a Prussian officer, unless on duty. A screen was drawn round the manœuvring ground, hermetically sealing it, so to speak. Well-informed eye-witnesses, who were by no means worshippers of the King, have avowed that since arms were first introduced, the world has never seen anything more brilliant or more like real war than these manœuvres.[2] The result of all this was shown in the battles of the Seven Years' War, in which, though undertaken almost invariably against superior numbers, victory declared itself, with few exceptions, for the Prussian arms. The military genius of Frederick the Great certainly does not suffer if it is admitted that without such troops as had been trained by him for war, he could never have carried out his plans, and that without such an excellent army the battle of Leuthen, fought against a threefold superiority in numbers, could not have possibly resulted in a Prussian victory.

Representatives from every Army in Europe were to be seen at the Prussian manœuvres after the Seven Years' War. A most interesting account of the development of peace manœuvres in Germany is given in Chapter IV. of Von Schellendorff's "Duties of the German General Staff"; and those who wish to pursue the subject further will find in the JOURNALS of the Royal United Service Institution for 1872 valuable and instructive accounts of the peace manœuvres at home and abroad between 1869 and 1872, when the subject began to be taken into serious consideration in Great Britain. In subsequent years a recurrence of minor wars intervened, but later the resumption of manœuvres became essential.

To the cavalry, manœuvres have been, and must always be, of the greatest importance. The first great cavalry manœuvres after the Napoleonic wars were held near Berlin in September, 1822; but lengthy-detailed instructions were issued: nothing was left to chance, and thus no scope was allowed for the initiation of individual leaders. An improvement on these manœuvres took place in 1843, when General von Wrangel assembled ten cavalry regiments and four batteries

[1] Von Schellendorff's "Duties of the German General Staff," Chapter IV.

[2] This, according to a practical military man, is no small measure of praise. General Brackenbury, writing in 1872, said "there is nothing so unlike a real battle as a sham one." JOURNAL R.U.S.I., 1872.

to test certain instructions which had been published in June of the previous year. Colonel French[1] has given an interesting account of the development of cavalry manœuvres in Germany since then. The cavalry in Great Britain seem to have followed entirely in the footsteps of the foreigner, and accepted his views without practically testing them, until Lord Roberts, when Commander-in-Chief in India, took the lead in giving practical effect to the long recognised and oft expressed need for annual independent cavalry manœuvres. A cavalry camp was formed in the Punjab in the winter of 1887, under the command of the present Inspector-General of Cavalry, since which date cavalry manœuvres have become an annual institution in that country. General Sir Evelyn Wood, when in command of the Aldershot District, initiated cavalry manœuvres in England. In 1889, the first year of his command, a brigade of three regiments, under Colonel Wood, C.B., was detached for ten days to camp some twelve miles south of Aldershot. In the following year a regularly arranged division of cavalry was assembled for a period of three weeks on the Berkshire Downs, under the immediate supervision of Sir Evelyn Wood and his staff; and in 1891 and 1892 a similar concentration was effected at Aldershot, under the supervision of the Inspector-General of Cavalry. In 1893 a cavalry division, commanded by the Inspector-General, formed part of the force assembled on the Berkshire Downs for manœuvres under Sir E. Wood; and the most recent assembly of cavalry, under the command and supervision of the Inspector-General, in the same country in 1894 is still fresh in the memories of all. The real object of manœuvres is to accustom the cavalry to act together in masses, in strict accordance with certain ascertained rules and methods; to train it as the great pioneer force of the army in the field—the eyes and ears of the Commander-in-Chief.

In consequence of the prospect of the harvest being somewhat later than usual this year, it has been decided to defer the opening of the Army Manœuvres, which will take place in the autumn in the counties of Wilts and Dorset, until the 1st September. According to the new arrangements the first regiment to go to Salisbury Plain will be the 1st Royal Dragoons. This will be on the 15th June, and the reason for this step is that the barracks at Hounslow which are now occupied by the regiment are required for the accommodation of four companies of Mounted Infantry, which are to be specially embodied for the manœuvres. Five other cavalry regiments will proceed to the Plain on the 1st July. During that month regimental and brigade training will take place, and on the 1st August Sir George Luck, Inspector-General of Cavalry, will take over the whole of the cavalry regiments for important Army Manœuvres, preliminary to the concentration of the other troops selected to take part in the Grand Manœuvres.

Some information regarding the fortifications of Cuba, and an account of the capture of Manilla by the British in 1762, will be found in the Foreign Notes under the heading of Spain.

An account of the capture of Cuba by the British in 1762 will be given in the June JOURNAL.

An Army Order has been issued by which the strength of regiments of cavalry of the Line is fixed as follows:—Regiments at home on the higher establishment, each 696 of all ranks, with 459 riding and six draught horses; on the lower establishment, 578 of all ranks, with 337 riding and six draught horses; regiments in the Colonies, 593 of all ranks, with 427 riding and six draught horses, and 117 of all ranks and twenty-seven riding horses at the Home Depôt; the regiment in Egypt, 488 of all ranks, with 355 riding and six draught horses, and 117 of all ranks and twenty-seven riding horses at the Home Depôt; and regiments in India, 624 of all ranks, with 525 riding horses.

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[1] "Cavalry Manœuvres," by Col. J. D. P. French, late 19th Hussars. JOURNAL R.U.S.I., Vol. XXXIX., p. 559. See also Von Kaehler's "Prussian Cavalry, 1806-76."

BOSNIA.—On the 1st May the regimental staff of each infantry regiment of Bosnia-Herzegovina was increased by 1 lieut.-colonel as staff-officer, 1 captain for extra employment, 1 senior lieutenant as pioneer officer, 1 regimental doctor of the first class, 1 clerk (a corporal), 1 mounted bugler, who is also available as a despatch rider, and 4 officers' servants. The release of forty-three infantrists from the Bosnian regiments, as ordered in 1895, was discontinued from the 1st of April. The mounted buglers of the Bosnian infantry are armed with the infantry officer's sword, and with a revolver and thirty cartridges. They wear boots, spurs, and cavalry belts.—*Militär-Zeitung.*

FRANCE.—A decree of the 22nd April defines the authority and duties of the superior commanders of fortress groups. The commander of such a group, except in cases fixed by the War Minister, is the governor of the principal fortress of the group and resides there. He also exercises territorial authority, but takes no command of the field troops except of such as are placed at his disposal in virtue of that authority. Under the army corps commander, he has the sole direction of the instruction of his troops.

The groups of Territorial Artillery were, on the 15th April, more effectively united to the Regular arm. They bear the numbers of the active corps to which they are auxiliary, and have their administration carried out by the latter; but the services of the territorial corps may be employed, when necessary, in the following cases:—In the pay department, one territorial lieutenant may be employed as assistant, and an under-officer, corporal, and gunner as clerks; in the clothing department a lieutenant may likewise be employed, with an under-officer and a gunner as clerks.—*Revue du Cercle Militaire.*

GERMANY.—Operations will be carried out by the army corps not taking part in the Imperial manœuvres, at such times as may least interfere with the crops. Infantry brigades of four battalions will perform their brigade manœuvres in concert with one of the brigades of their army corps. The commanders of army corps will give orders accordingly, although in exceptional cases, the War Minister is authorised on the request of such commanders to prescribe special exercises for these brigades.

In the choice of localities and in the conduct of operations, every effort must be made to keep down the expense caused by damage. If in any case the latter is likely to be great, the War Minister has to report the circumstance to the Emperor.

Detailed orders will be issued to regulate the staff journeys in army corps, as well as the grand journeys of instruction in the cavalry to be carried out by cavalry generals and superior officers and by commanders of horse artillery groups. The latter journeys will be performed by the 4th, 7th, 9th, 10th, 11th, 15th and 17th Corps of the guard.

Grand operations by pioneers will take place at Thorn, on the Mulde and Elbe, between Grimma and Weissen, and on the Rhine at Germersheim. Detailed orders will be issued by the Inspector-General of Pioneers and Engineers. The 30th September is the latest date fixed for the return of troops to their garrisons.

The following additional memoranda have been sent out by the Minister of War:—The number of horses to be supplied to officers who may be present as umpires, guests, etc., will be specially prescribed. In the cavalry manœuvres all regiments must have as many men mounted as the state of their horses will permit. Detailed instructions will be given with regard to the balloon sections and the detachment of cyclist pioneers to be attached to the B Division of cavalry. For the cavalry journey of instruction 3,000 francs will be paid to the guards cavalry, 2,625 to the 11th Corps, and 2,250 to six other corps. A sum of 500 francs will be placed at the disposal of each of the cavalry divisions, A and B, for expenses occasioned by the technical work of pioneers. This allowance is not to be exceeded.—*Revue Militaire de l'Étranger.*

ITALY.—The War Budget for the year from the 1st July, 1898, to 30th June, 1899, reaches the amount of 273,016,500 francs, but after deducting pensions and other expenses which do not directly concern the department it is reduced to 239 millions. Of the latter sum upwards of 29 millions are absorbed by the Royal Carabiniers (gendarmery), 500,000 francs by the National Target Shooting, about 500,000 by the military schools, etc., and probably 205 millions will remain for the Army itself. The War Minister intends, with this money, to have under arms an average of 12,949 officers, 188,701 soldiers, 8,698 officers' horses, and 32,632 troop horses. This is exclusive of the Carabiniers, whose strength is 537 officers, 23,022 men, 1,059 officers' horses, and 3,579 troop horses.—*Revue du Cercle Militaire.*

It is decided that this year's grand manœuvres will be carried out in Piedmont from the 1st to the 12th September. The King will be present. The 1st (Turin) Army Corps, the 2nd (Alexandria), a cavalry division, and a division of mobile militia, will be engaged. The Sardinian Division will manœuvre from the 28th May till the 8th June. The cavalry not taking part in the grand manœuvres will drill regimentally or in brigades. A staff journey is to take place under the chief of the general staff.—*Militär-Wochenblatt.*

RUSSIA.—The St. Petersburg Club for officers of the Army and Navy was opened in presence of the Emperor on the 22nd March. It was founded for the purpose of promoting the convenience and comfort of officers whether serving in St. Petersburg or stopping there *en route.* The building contains the offices of the Guards' Co-operative Society, rooms for lectures, the ordinary rooms of a club, and bed-rooms for officers passing through the capital. The Emperor gave two millions of roubles towards the object, in the belief that it would strengthen fraternal feeling amongst the officers.—*La France Militaire.*

Russian generals are of four grades, major-general, lieutenant-general, general, and general-field-marshal. The last dignity is seldom conferred, and is at present held by only two officers, namely, the Grand Duke Michael and General Gourko. In time of war the Emperor would either appoint a general to the supreme command, or assume that duty himself, and in the latter event the general of his choice would become chief of the general staff. The duties of the commander-in-chief are to make and terminate armistices if the circumstances do not admit of a reference to the Emperor, to alter the composition of armies and bodies of troops, to appoint regimental commanders or officers of that rank, to appoint governors-general of occupied provinces, and, provisionally, commanders of armies, corps, and military districts. Promotion as far as to the rank of captain is within the rights of the commander-in-chief, also the bestowal of the Vladimir Order of the fourth class, and the levying of contribution in hostile territory.

The commander-in-chief will be assisted by the general staff, besides which must be counted his personal *aides*, generals for special purposes, and a higher official of the Foreign Office, for diplomatic business and the conclusion of conventions or armistices. The Emperor appoints the chief of the general staff, who, if the commander-in-chief be ill, takes supreme command. In the event of the death of the commander-in-chief, the chief of the general staff succeeds him until his permanent successor is named by the Emperor. The three great divisions of the general staff are the quartermaster-generals, the generals of the day, and the railway divisions. The first deals with strategic operations and intelligence; when the chief of the general staff is sick or absent the quartermaster-general does his duty. The generals of the day have charge of the effective and the inspection office, administration, military law, and the commander-in-chief's headquarters.

The railway division conducts the traffic on the railway system of the scene of operations, as well as the building and repairing of railway lines.

The commander-in-chief of the Russian armies would have attached to him 5 generals, 6 staff officers, 3 subalterns and 1 official. Attached to the chief of the general staff would be 2 generals, 3 staff officers, and 1 subaltern. Of the quartermaster-general's division of the general staff, there would be attached to each army 1 general, 3 staff or subaltern officers, 1 ordnance (subaltern) officer, 1 interpreter, and 1 office official. That of the generals of the day would supply 3 generals, 3 staff officers, 9 subalterns, and 15 officials, of whom 5 would be road-making engineers. The railway division would supply 1 general, 4 staff officers, and 7 officials.

The command of a single army would usually be given to the commander of the frontier military district in which the mobilisation might take place. The general staff of the military district is the nucleus of the general staff of the Army. The commander of an army has duties similar to those of the commander-in-chief, but less in degree. He can decorate with the 4th class of St. George, the 2nd, 3rd, and 4th of St. Anne, and the 2nd and 3rd of St. Stanislas. He has, in addition to his *aides*, special officers, and officials, the assistance of the general staff, under a lieutenant-general or major-general. The quartermaster-general's division attends to strategical and tactical operations, statistics, intelligence, and topography. In the generals of the day's division are troops, sanitation, law, printing, divine service, the medical service, and the command of the headquarters. The division for communications embraces depôts, roads, telegraphs, post-office, and transport. There is also the general office for business, accounts, and secret correspondence.

The command of an army corps, if operating independently, would be given to a general, but if forming part of an army might be under a lieutenant-general. In the former case the corps commander would have the powers of an army commander, except that he could not confer decorations; in the latter case his powers would be the same as in time of peace. If his corps form part of an army, his staff will be considerably smaller, but if independent it will be similar to that of an army, although proportionately less.

The generals commanding the districts of Wilna, Warsaw, and Kieff would have the command of armies in war; they are invested with territorial command, and the general staff in their districts is organised for war. The commanders of army corps have no territorial powers, and can therefore give their whole attention to their troops. It is evident that, in the Russian Army, arrangements are not left to the moment of mobilisation, but that they are tried and proved in time of peace; and that the officers, whatever their rank may be, who have taught and trained their men, are to have the honour of leading them against the enemy. Is there any better means of preserving a sense of responsibility and of maintaining mutual confidence among officers and soldiers?—*Deutsche Heeres-Zeitung.*

The formation of a new independent sotnia has been ordered. It will form the 6th Sotnia of the 1st Circuit, and will be recruited from among the Cossacks of the Don belonging to junior classes of the active category. The Oussouri Railway Battalion, which was formed about two years ago, has been now augmented by two new companies. The whole battalion is on a war footing. A Telegraphic Section has been created at Vladivostok.—*Revue Militaire de l'Étranger.*

In the autumn of 1897, ten years had passed since the introduction of universal military service into Trans-Caucasia and some regions of the Northern Caucasus, inhabited by non-Russian races. The measure was gently applied at first; for instance, the Mahomedan population could obtain exemption by paying

a tax. Up till that time the Caucasus had furnished almost no troops but Militia. The change to universal service involved difficulties from economical, national, and religious points of view, and therefore the course pursued by the Government is interesting in itself, and instructive with regard to the military future of the Caucasus. In addition to Cossacks, there are in the Caucasus 4 field-infantry divisions with their own artillery, 1 cavalry division, 1 rifle brigade, 1 sapper brigade, fortress troops, etc., all composed of Russians. Then there are 4 Caucasian reserve infantry brigades, which in war would become divisions, and 2 reserve cadre battalions, intended, in war, to form regiments of 5 battalions. The natives were led by easy stages into their new responsibilities. In 1889 a native brigade was formed in order to make the service popular in the district, but by degrees everything outwardly distinctive was abolished, and Russian uniform was adopted. In 1893 this brigade ceased to exist so far as its native character was concerned, two of its four regiments being replaced by Russian ones. Hitherto the people had been liable to three years' service with the colours; now four years became law, and in 1894 the native regiments were thrown open to Russians. Almost the last trace of separate nationality was thus removed from the troops in the Caucasus, and it is said that in 1900 there will be no Caucasian dress even in the reserves. It is in the interest of Russia to mix the Russian and the native troops, and to extend the obligation to military service among all the inhabitants of the Caucasus.—*Militär-Wochenblatt.*

Before the end of the current year the troops hereafter enumerated will be stationed in Eastern Asia, but it is said that their strength is not sufficient to justify alarm or suspicion on the part of foreigners:—Infantry—10 regiments of East Siberian Rifles of 2 battalions each, 2 brigades of line infantry amounting to 11 battalions, 1 regiment of fortress infantry at Vladivostok, consisting of 4 battalions, 4 local battalions, and 2 battalions of Trans-Baikal Cossacks. Cavalry—The regular regiment "Primorskii" of 4 squadrons, 12 squadrons furnished by the Trans-Baikal Cossacks, and 8 squadrons of Armour and other Cossacks. Artillery—10 batteries of regular East Siberian Artillery, 2 batteries of regular Trans-Baikal Artillery, 2 Trans-Baikal Cossack batteries, and 2 fortress artillery batteries at Vladivostok. Engineers — 4 companies East Siberian Sappers, 6 companies Oussouri Railway Battalion, 2 companies of Miners at Vladivostok and Nicolajeffsk, and one telegraphic company at Vladivostok. The totals are 41 battalions, 24 squadrons, 14 batteries and 2 battalions of artillery, and 13 companies of Engineers.—*Special Correspondent of the Revue Militaire Suisse.*

SPAIN.—With regard to the foreign legion which it was proposed to raise in aid of Spain, it would require a squadron to convey it across the Atlantic, and protect it from American cruisers. Such assistance as a foreign legion could render would only be appropriate on this side of the ocean. The same may be said of the corps which some wealthy Frenchmen offered to fit out at their own expense. Moreover, there are already enough of Spanish soldiers, as may be proved by the fact that last year the War Minister called for not more than 30,000 men of the class of 1897, on the ground that he had more than sufficient. Every year about 40,000 young men are passed into the Spanish Army to maintain its peace effective. Service in the Standing Army lasts three years, in the first reserve three years, and in the second reserve six years. All are liable to conscription, with the ordinary exceptions. Exemption is, however, not permitted as in France on the ground of higher courses of education, but young men of means can obtain it by *rédemption métallique*, as it is called in Spain, or, in other words, by a payment of 2,000 francs.—*La France Militaire.*

The Central School of Gunnery consists of two sections, and is commanded by a general. The first or Madrid section is intended for field, siege, and fortress artillery; the second, or Cadiz section, for coast artillery. The duration of the course in Madrid is from four to five months, and it is attended by a senior lieutenant from each regiment and battalion. The 1st Fortress Battalion, the 1st Mountain Regiment, and a field regiment detach a battery to the school for the whole period of instruction. Two other field batteries and a horse battery are placed at the disposal of the director of the school, in case he should judge their services necessary. Among the siege and fortress material are guns of 12 and 15 centimetres, howitzers of 12 and 21 centimetres, and mortars of 15 centimetres. The course includes lectures on ballistics, ordnance, ammunition, the artillery practice of different armies, and the attack and defence of fortresses. The Cadiz section was organised in 1890. The course takes place after that of Madrid, and lasts for a month and a half. Each regiment and battalion sends a senior lieutenant to attend it, and a company of the 6th Fortress Battalion, with its officers and a minimum effective of 80 men, is placed at the disposal of the director, to assist in the work of the school as well as to complete its own instruction. Besides this, the 2nd Fortress Battalion is available when required. The course includes lectures on coast defence, actual practice, and the use of service material.—*Revue d'Artillerie.*

Very little appears to be known in this country of the defences of the city of Havana. The picturesque old fortalice, Morro Castle, the bombardment of which appears to the popular mind as the indispensable preliminary to the capture of the Cuban capital, is, so far as its military value is concerned, a myth. It is a beautiful and interesting specimen of mediæval fortification; but like the fortress of La Cabaña, whose ramparts crown the heights on the eastern shore of the harbour, it is practically unprotected. There was a time when these two great fortresses made Havana a place of strength, rivalled only by Gibraltar, but those days are long gone by. Stripped of all armament, they exist to-day merely as splendid examples of bygone Spanish power.

To obtain a clear idea of the possibilities of the defence of Havana against attack by land and sea, it is necessary to understand the topography of the city and harbour and to realise distinctly that the reduction of the place is by no means predicated on the entrance of the fleet into the port. In the old days, it is true, Havana was almost impregnable, the Morro, La Cabaña, and the ancient Castillo de la Punta, opposite the Morro, defending it absolutely from sea attack; while the ancient walls of the city made it secure against assault by land. Now all is changed, for the city long ago outgrew the ancient circumvallation and now extends miles beyond it, both inland and along the shore to the westward of the harbour mouth. In a word, the modern city of Havana lies broad on the sea, and the harbour, the possession of which was formerly indispensable to the reduction of the place, simply exists on a sort of pocket or arm of the sea running in behind the city. A fleet lying off shore at a distance of three or four miles can hold the entire city under the fire of its guns without other risk than that which is involved in receiving the fire of the few modern batteries which at long intervals line the sea front of the town. By a night bombardment two or three ships, the range for which could only be guessed at by the batteries, could probably lay the whole place in ruins before morning, with a minimum amount of danger.

The modern defences of Havana, with the exception of torpedoes, which cut but a small figure in the problem of attack, have been erected on the seacoast, eastward and westward of the mouth of the harbour. To the eastward the first position that demands attention is an outwork of Morro Castle, called Battery Velasco, which mounts three heavy Krupp guns of an obsolete type, and three 9-inch American Parrott muzzle-loaders, guns of the style that became obsolete twenty-five years ago. These are mounted behind masonry, and offer no

obstacle to the attack of even unarmoured ships. On the harbour front of the Morro is a water battery mounting on barbette five ancient cast-iron muzzle-loaders, formidable enough to the eyes of the tourist entering the harbour, but valueless in a military sense.

About a mile to the eastward of the Morro stands the only approach to a formidable modern work which is called the Playa del Chivo Battery. It mounts two enormous 12-inch Krupps of the very latest type, two or three small mortars and two 6-pounder rapid-fire guns; but the rocky shore, upon which a surf beats incessantly, is of such a character as to absolutely preclude the possibility of landing troops anywhere between Cojimar and Carmelo. On the shore side the battery is protected against infantry attack by a light stone wall, abundantly loopholed for musketry fire. Strong as La Playa del Chivo is in one sense, it possesses one fatal defect in the fact that the great Krupps are mounted high above the parapet of sand, completely exposing both guns and carriages to the fire of ships.

A mile or so further to the eastward stands another sand battery of similar construction. It mounts four 8-inch Hontoria rifles, and as many small mortars. The battery is too far distant, and its armament is too weak to play more than a minor part either in the defence of the city or in that of the little haven at Cojimar, which the British selected as a landing place in 1762, and which may serve now for a similar purpose.

From Cojimar, where the shore end of the cable lands, there is a fine high road running to Guannabacoa, whence two railroads run to Havana, and another runs through the wilderness, or "manigua," past the two sand batteries, to the Morro and La Cabaña.

To the westward of the harbour entrance the shore of the city (lined, be it remembered, with closely-built streets and handsome suburban residences) extends for three miles or so around a shallow bay, at the eastern horn of which is the ancient Punta. Next to it, and in immediate proximity to a crowded district, is the battery La Reina, a hopelessly obsolete masonry work mounting a half-dozen or so old muzzle-loaders of American make. A few blocks to the westward lies the great Santa Clara Battery.

Santa Clara is a combination of earthwork and the kind of concrete work that is generally employed in modern fortifications. A defect only second to its position, rendered unavoidable by the topographical conditions, is its armament. This is heavy enough as far as the calibre of the pieces is concerned, but it is badly deficient in quality. It consists of two long 12 inch Ordoñez guns and three Krupps of the same calibre. The Ordoñez guns are Spanish pieces, consisting of steel tubes reinforced by cast-iron jackets. Under these conditions it is not surprising that one of the gun tubes cracked during the experimental firing a year ago. It is reported that the emplacement of the companion gun became so depressed at the same time as to almost completely disable the piece. This, however, has probably been remedied. The three Krupps are serviceable weapons, but are of the old-fashioned short type. Another defect in the Santa Clara battery is the fact that its guns are deficient in train, particularly to the westward, from which quarter the attack of the fleet will probably be directed. On the beach, just below Santa Clara, and about 300 yards to the westward, lies a little masonry battery, mounting four mortars of but 8-inch calibre.

At the foot of H Street, a mile or so further westward, lies another battery, with a fine armament of four Hontoria steel rifles of about two of 10 and two of 6-inch calibre. They are not mounted behind heavy earthworks, as is the modern practice in all countries, but their muzzles rise in barbette above simple masonry. Fine masonry it is, cemented and put together like mosaic, as all Spanish masonry is.

One more battery of precisely similar combination on the shore half a mile still further west completes the seaward defence of Havana. It contains four 6-inch Hotchkiss rifles, mounted like the rest.

Reproduced from "El Memorial de Artillería," Madrid.

Within pistol shot of this last battery is the little cove at the mouth of the Almendarez River, which, so far as landing operations go, is the key to Havana. Its sole pretence to protection is a curious old castle, which enjoys the distinction of being the most ancient edifice of European construction in the New World, having been built early in the sixteenth century.

Here a landing of troops in any force could be effected without difficulty, and along the shore lies a fine high road and a railroad, affording an easy route to the assault in flank of one battery after another, and finally to the heart of the city itself. This, however, would necessarily be accomplished only at the cost of much life, for which there appears to be little excuse. The fatal defect in this whole system of shore batteries lies not alone in the fact that they are individually weak, but that no one of them supports another. Hence, a fleet approaching from the westward could with perfect ease demolish battery after battery by flank fire. After this it would be time enough to consider the matter of landing troops in Almendarez Cove, and of marching them into the city along the beach under fire of the fleet's guns. In addition to the batteries described, Havana possesses two permanent works designed for the land defence of the city. The more important of these, the Castillo del Principe, covers the high ground on the western outskirts of the town.

It serves principally as a military depôt, with barracks, hospital, and offices of administration. While it might contribute in a measure to defence against an invading army, it offers no obstacle to the attack of a fleet. Its armament is insignificant, consisting of a few ancient pieces of cast-iron artillery and four modern mortars of only 8-inch calibre. Still less important is the old Castillo de Atares, the masonry bastions of which crown a little knoll on the southern side of the city.

The exterior line of land defence, or the Havana trocha, runs from Marianao on the westward to Cojimar on the east, a distance of twenty miles or more. It consists of a carefully constructed barbed-wire fence, with block-houses at intervals, and is admirably adapted for repelling the incursions of wild cattle. As a military expedient it is the wonder of all foreigners who have seen it.

Mines have been placed in the harbour, and probably to cover these mines General Blanco has very recently caused a strong battery to be erected on the shore opposite the Presidio, between La Punta and the old battery at the end of Cuba Street. It is said to mount one 10-inch and two 8-inch Hontoria rifles, the fire of which may be directed straight out to sea between La Punta and El Morro.

Throughout the whole system of fortifications there is not one piece mounted on a disappearing carriage, all with the exception of the few small mortars rising fully exposed above parapets, for the most part of simple masonry.

The following notes on the armament of Puerto Rico (Spanish West Indian possession) have been contributed by Lieut.-Colonel J. C. Dalton, R.A., commanding Royal Artillery, Bermuda :—Now that war has broken out between Spain and the United States of America, the island of Puerto Rico assumes an importance which otherwise it would fail to command. Puerto Rico (or Porto Rico) is a large rectangular-shaped island lying roughly between the parallels of 18° and 18° 30′ N. Lat. and between the meridians of 65° 30′ and 67° 10′ W. Long. It is very mountainous, and is situated just west of the Virgin Islands and east of the Republic of Hayti or San Domingo. It is about 600 miles from Havana. The chief town and port is San Juan de Puerto Rico, which is on the north side, almost on the 65th meridian San Juan contains a harbour which is now being used as a naval base for the Spanish fleet, and will no doubt form an important strategical point in this war. The *Memorial de Artillería* of February, 1898 (published in Madrid), gives a brief notice of the work of hurrying forward the armament of this port, and considering the size and nature of the ordnance

which was to be mounted, the stores and material at the disposal of the artillery stationed in the island appears to have been very inadequate. Emplacements for heavy guns were selected, and the sites being very high the work of mounting the guns seems to have been decidedly arduous. The following pieces had been mounted at the date on which this article was written, probably about the end of 1897, viz. :—17 rifled-tubed B.L. guns of 15-centimetre (6-inch), 10 rifled B.L. howitzers of 24-centimetre (9·4-inch). These had to be conveyed through narrow paved streets, some with a slope of $\frac{1}{12{\cdot}5}$. In the citadels Del Morro and San Cristobal the ramps of ascent were in some cases as steep as $\frac{1}{8}$. To mount the two 15-centimetre guns in the ravelin of San Carlos it was necessary to raise them through a vertical height of 7 metres, and for want of rope of sufficient resistance recourse was had to twisting together smaller ropes. A photograph is given of this operation. There being no proper crane or sheers, travelling cranes were used, two together; and in one case, to save time, a 15-centimetre gun was mounted on a high mounting by means of one of these. With these scanty materials, aided by an Aveling-Porter traction engine and eight (sixteen-year old) horses, the gunners had the satisfaction of doing what was required of them without any accident or waste of time, and without extra expense beyond that ordinarily allotted. Over 1,500 tons weight were moved. The authorities have now provided for equipping the work with range-finders, according to a design of Captain Don Ramón Acha.

In the records of the British victories gained in 1762, over the French and Spaniards, the capture of Manilla occupies a prominent place. The inception of this enterprise was due to accident rather than design. Colonel (afterwards Sir William) Draper was obliged to leave India soon after the successful defence of Fort St. George Madras, in which he bore a conspicuous part, as his health broke down from the strain of hard work in a trying climate. He sailed to Canton, where he remained for some time. During his stay, he made himself acquainted, by careful inquiries, with the extent and condition of the Spanish settlements in the Philippine Islands. He learned that the Spaniards were not apprehensive of an attack, in the event of war with England, which was then imminent. Trusting to their situation, remote from the ordinary routes of British trade, and beyond the range of probable hostilities, they had taken no defensive precautions ; their fortifications were neglected, and their discipline was relaxed. The chief of this numerous group of islands, Manilla, or Luconia, or Luzon, as it has been variously called, is about 300 miles long, and varies in breadth from 200 miles to 80. Manilla, the capital, lies in a large bay of the same name, on the east side of the island. The town is of irregular figure, but it may be roughly described as a triangle, of which the longest side faced the sea. At the northern extremity, in an acute angle formed by the sea and the Rio de Pasig, the citadel was built. The wall that bounded the town had eleven bastions of various forms and at irregular distances. The lower storeys of the houses were mostly built of stone, but the upper storeys were of wood—a mode of construction found to be the least dangerous in the earthquakes with which the island was occasionally visited.

On his return to England, Colonel Draper laid before the Government a clear and forcible statement of the information he had acquired ; and when, in January 1762, war was declared against Spain, he obtained their concurrence in his design of attacking Manilla before the news of the outbreak of war could reach that distant settlement, and, consequently, before any adequate preparations for resistance could be made. The great advantage of secrecy would be lost, if an expedition were prepared in England ; so Draper returned to India in 1762, fully authorised and instructed. On his arrival at Madras, he encountered much opposition ; and when, on the 28th of June, he laid his designs before the Council, Major-General Lawrence, Mr. Bourchier, and Major Call the chief engineer,

dissented, and considered the projected expedition inexpedient and rash. The orders and instructions that Draper brought out were, however, so explicit and unequivocal, that the Madras authorities reluctantly acquiesced, and the requisite preparations were commenced.

The force ordered for embarkation consisted of 450 of the 79th, Draper's Regiment; 60 of the Royal Artillery, and 30 of the Madras Artillery; 200 deserters of different nationalities, but chiefly French; a company of Coffrees and one of Topasses, each 80 strong; 60 European pioneers; 650 Madras Sepoys; and, lastly, some 60 Europeans in the service of the Nawab of the Carnatic; altogether 1,670 of all arms and ranks. Colonel Draper was commissioned to command, with the rank of Brigadier-General; Colonel Monson of the 79th was either second in command or Quarter-Master-General; Major Scott of the 89th Highlanders (Munro's) was Adjutant-General; the Artillery, both King's and Company's, were placed under Major (afterwards Sir Robert) Barker, an officer often honourably mentioned in the records of Indian campaigns; and the other staff and departmental appointments were suitably filled. When the preparations were nearly complete, a frigate was sent to the China Seas to stop all vessels bound for Manilla, and so to prevent any warning from reaching the place of the intended attack. The naval part of the expedition, consisting of 8 ships of the line and 3 frigates, was under Vice-Admiral Cornish, an able and experienced officer.

The squadron, accompanied by some transports, sailed from Madras in two divisions, the first on the 1st of August, and the second soon after. It arrived at Malacca on the 19th, and after a voyage of moderate duration for those days, anchored in the bay of Manilla on the 23rd of September. The next day a Spanish officer came off to ask what it all meant! He was not left long in ignorance, for a landing was effected in the evening, under the fire of the frigates, about two miles south of the town, without loss of life, though the surf was heavy and many boats were destroyed. In addition to the land forces, 12 naval officers and 667 sailors, 19 officers and 319 men of the marines were also landed from the fleet. On the 25th a small fort called the Polverista, and the Hermita, a large and commodious church, half a mile from the walls, were occupied. These buildings were found very useful, as safe places for stores, and as giving cover from the rains which had deluged the country, and rendered encamping impracticable. The surf was still dangerous, and when landing some Madras Sepoys, Lieutenant Hardwick of the Company's service and a few men were drowned. On the 26th, 400 Spaniards, with two guns, advanced from the town and attacked the right of the besiegers' position, but they were soon repulsed, leaving one of their guns behind them.

The south face was selected as the part to be attacked, because, though at first it appeared the strongest part, further observations showed its defects. Its two bastions had orillons and retired flanks, it had a ravelin covering the "royal gate," a wet ditch, covered-way, and glacis; but the ravelin was not armed, the covered-way was out of repair, the glacis was far too low, and the ditch was not carried round the capital of the bastion nearest the sea. From the smallness of the besieging force, *only a fourth the number of the garrison*, anything like an investment could not be attempted, and supplies and reinforcements could be brought into the town at any time. Yet with these almost unexampled disadvantages, the siege work progressed fairly and with little interruption. On the 28th, Lieutenant Fryer, the General's secretary, was sent to escort into the town the Governor's nephew, who had lately been taken prisoner in the bay. When Fryer approached the walls, some Spaniards and Indians, who were attempting a sortie, drew near. The Indians rushed at the unfortunate officer, disregarding, or not understanding, his flag of truce, and murdered him, mangling his body shockingly and mortally wounding the young Spaniard who had vainly attempted to save him.

Ground was broken on the 29th, and breaching batteries were begun. A heavy gale, on the night of the 1st of October, drove a store ship on shore, but

this proved an advantage, for the ship was not damaged, and the stores were easily landed. Neither the gale nor the torrents of rain stopped the working parties, who completed an eight-gun battery during the night. On the 3rd, a breaching battery opened fire against the St. Diego bastion (that next the sea) with such effect that the enemy's guns were silenced in two hours, and the bastion was rendered untenable. About 3 a.m. on the 4th, a thousand Indians suddenly attacked the part of the lines occupied by the sailors, and killed and wounded several before they were repulsed. Shortly after, another body of Indians, with part of the Spanish garrison, attacked the Sepoys with great impetuosity, and drove them back. Some of the 79th, however, came to support them, and the assailants were defeated with the loss of 70 Spaniards killed; of the loss of the Indians, no account is given. On our side, Lieutenant Porter, R.N., and Captain Strachan of the 79th were killed, and about 40 others were killed or wounded. In both these attacks, the Indians fought with extreme ferocity, rushing up to the muzzles of the muskets, and, in many cases, according to Draper, "died like wild beasts, gnawing the bayonets!" Discouraged by their heavy losses, and by the failure of their desperate attacks, most of the Indians returned to their homes, leaving only 1,800 of the 10,000 who had come to aid the garrison. The breach was reported practicable on the 5th, and all the enemy's guns bearing on it were silenced: so Draper determined to storm the place before daybreak the next morning.

At 4 a.m. on the 6th, the several parties detailed for the assault began to file out quietly from their several quarters, and soon assembled near St. Jago's church. At daybreak, a heavy fire was opened from guns and mortars, which dispersed a body of Spaniards in the left bastion. Under cover of the dense smoke of this cannonade, which was blown towards the town, the stormers advanced quickly but silently. First came 60 volunteers from different corps, led by Lieutenant Russell of the 79th; next, the 79th Grenadiers; then the pioneers, to clear the breach, and to make lodgments, if required; the rest of the 79th, the sailors, and the Sepoys followed. The breach was quickly reached and passed, without much opposition; but some guard-houses and other buildings were obstinately defended. These places were stormed in succession, and as their occupants would not surrender, they were killed. Our loss in the storming was:—Major Moore of the 79th, killed by an arrow, and about 33 officers and men, killed or wounded. The Governor, who was also the archbishop, and the principal officers retired into the citadel, but they surrendered about 8 a.m. As the place had been taken by storm, without a capitulation, it was impossible to prevent excesses on the part of some of the captors, but order was soon restored. Our total loss in the siege was:—4 officers and 28 men killed, an officer and 6 drowned, and 5 officers and 106 men wounded. The Spaniards had 3 officers and 82 killed, but the number of wounded is not stated. The savage Indians are said to have had 300 killed and 400 wounded.

A capitulation was signed, on the day of the capture, conceding the sovereignty of the Philippine Islands to Great Britain, and granting to the city of Manilla and its inhabitants immunity from plunder, in consideration of a ransom of four million dollars. The town was saved, but the ransom was never paid!

The English remained in possession till the end of March 1764, when news of the treaty arrived, and we lost by the pen what we had gained by the sword.

The chief authorities for the above narrative are: An account by Captain E. O'Callaghan, F.S.A.; General Draper's journal, as given in Beatson's Memoirs; Colonel Wilson's carefully-written History of the Madras Army; Colonel Vibart's History of the Madras Engineers; and Campbell's Lives of the Admirals. The accounts given in many other works are evidently erroneous.

SWITZERLAND.—The military department has demanded and obtained a supplementary credit in order to carry out improvements in the grand manœuvres of 1898. An extra sum of 70,000 francs has been voted to cover the expense of employing a division to mark the enemy against the 4th Army Corps. The total credit for the manœuvres is 220,000 francs.—*Revue du Cercle Militaire.*

NAVAL AND MILITARY CALENDAR.

APRIL, 1898.

1st (F.) 9th Lancers arrived at Bombay from Durban, in the Indian Marine troop-ship "Clive."

4th (M.) Anglo-Egyptian Force marched to Abadar, 14 miles from the Dervish position.

5th (Tu.) Reconnaissance in force by the Anglo-Egyptian Army.

" " Publication in *London Gazette* of despatches in connection with the Tirah Expedition.

7th (Th.) Angle-Egyptian Army marched from Abadar to Umdabia, 7 miles from the Dervish position.

" " Launch of H.M. second-class cruiser "Hermes" from the Fairfield Yard, Govan-on-Clyde.

" " H.M.S. "Hermione" commissioned at Devonport for China.

8th (F.) Battle of the Atbara. Dervish force under Mahmoud defeated by the Anglo-Egyptian Army under the Sirdar.

15th (F.) 25th Company Eastern Division Royal Artillery embarked for Hong-Kong.

16th (Sat.) Resolution of the United States Senate in favour of the independence of Cuba.

" " H.M.S. "Orlando" arrived at Portsmouth from Australia.

17th (S.) H.M.S. "Brisk" arrived at Plymouth from the East Indies.

18th (M.) H.M.S. "Hermione" left Plymouth for China.

19th (Tu.) 3rd Bn. West India Regiment arrived at Freetown, Sierra Leone, from St. Helena.

20th (W.) Egyptian railway completed to El-Abeidieh, 15 miles north of Berber.

21st (Th.) H.M.S. "Rapid" paid off at Devonport.

" " United States ultimatum despatched to Spain.

22nd (F.) Publication in *London Gazette* of despatches of Major-General Sir Bindon Blood regarding operations of Bunar field force.

" " Launch of H.M.S. first-class cruiser "Ariadne" from the Clydebank Shipbuilding Yard at Glasgow.

24th (S.) H.M.S. "Active" paid off at Devonport.

25th (M.) United States declaration that war had existed with Spain since the 21st April.

" " H.M.S. "Raleigh" commissioned at Devonport.

26th (Tu.) 1st Bn. Royal Canadians (Leinster Regiment) left Queenstown for Halifax in the "Dilwara."

" " Proclamation of neutrality, dated 23rd April, on the part of Great Britain in the Spanish-American war, published in *London Gazette.*

30th (Sat.) H.M.S. "Brisk" paid off at Devonport.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval.* Buenos Aires: January and February, 1898.—"The Navigation of the Rio Negro." "Employment of Artillery in Naval Battles." "The next Naval War." "Study of the Naval Medical Service on board ship." "Home and Foreign Naval Notes."

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. 5. Pola and Vienna: April, 1898.—"On the Question of Ship's Boilers." "Chemical Results of the Austro-Hungarian Deep-Sea Expedition." "The Contemplated New Organisation of the Naval *Personnel* in the United States." "On the Construction of Torpedo-boats." "The Mishap to a French Torpedo-boat." "Foreign Naval Notes." "Book Notices."

No. 6. May, 1898.—"Ballooning for Naval Purposes at Sea." "The Steam Trials of the English Cruiser 'Diadem.'" "The Submarine Diving and Salvage Boat 'Argonaut.'" "The United States Naval Budget for 1899." "Foreign Naval Notes." "Book Notices."

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: March, 1898.—"The Penetration of Projectiles." "The Evolution of Navies during the Last Ten Years." "Aeronautic Projects." "Foreign Naval Notes."

FRANCE.—*Revue Maritime.* Paris: March 1898.—"The Solution of some Cinematic Problems." "The Right of Search in Time of Peace." "Current and the Exact Position of a Ship, when in Sight of the Coast and only able to obtain Bearings of a Single Point." "On the Diagrams from Networks of Electric Conductors." "Submerged and above-water Torpedo-Discharges." "Project for a Hospital-ship." "Foreign Notes." "The Maritime Fisheries."

La Marine Française. Paris: 15th April, 1898.—"The Maritime Policy and Naval Strategy of Italy." "An Anglo-French War" (*continued*). "German Opinions of the Military Interests of the Sea-Powers in the East." "An Attempt at the Reform of the *Personnel*." "The Chinese Navy." "The Mercantile Marine." "Naval Notes."

Le Yacht. Paris: 2nd April, 1898.—"The Acquired Rights of Officers." "Yachting Notes." "The Spanish Battle-ship 'Vitoria.'" "The Cruise of the 'Powerful' from Portsmouth to Hong-Kong." 9th April.—"The Navies of the United States and Spain." "Yachting Notes." "The Second-class cruiser 'Pascal.'" 16th April.—"The Specialisation of Cruisers." "Yachting Notes." "The Boilers of the Spanish Battle-ship 'Pelayo.'" "The Torpedo-aviso 'Casabianca.'" 23rd April.—"Exercises in Coaling Ships." "Cruiser War and International Maritime Right." "Torpilleurs-de-haute-mer." 30th April.—"The War between Spain and the United States." "Yachting Notes." "The 'Jeanne d'Arc.'" "The Introduction of Displacement into the Formula of Tonnage."

Le Moniteur de la Flotte. Paris: 2nd April.—"Affairs Abroad." "The Naval Budget in the Senate." "The loss of the 'Ariel.'" "The Mobilisation of the Squadron of the North." "The Fisheries and Ostriculture." 9th April.—"The United States and Spain." "The Navy in Parliament." "The Loss of the 'Ariel.'" 16th April.—"The Austro-Hungarian Navy." "The Naval Depôts." 23rd April.—"The Training-ship for Aspirants." 30th April.—"Ships built on spec." "The War between Spain and the United States."

GERMANY.—*Marine Rundschau.* Berlin: April, 1898.—"The Law of 10th April, 1898, regarding the Increase of the German Fleet." "Strong Lights upon the Mediterranean." "The Breakdown of the Machinery of the U.S. Torpedo-boat 'Rodgers.'" "The Development of Wireless Telegraphy." "The Influence of the Inequality in the Turning Moments of the Engines and its Dependence upon the different Angles of the Crank." "On Naval Manœuvres in Ancient Times." "The Relative Positions of Spain and the United States for a Naval War." "World Intercourse" (*concluded*). "The Former German Fleet and the Grand Duchy of Oldenburg" (*continued*).

ITALY.—*Rivista Marittima.* Rome: April, 1898.—"The Inspirer of Columbus, Paolo Toscanelli." "On a Method for Change of Bearings between the Units of a Naval Force." "The Capabilities of the Merchant-ship (steam and sail)." "Naval Crews." "Water-tight Bulkheads: New Regulations of the German Lloyd for Transatlantic Steamers." "Italian Naval History" (*concluded*). Letters to the Director:—"On Water-tube Boilers." "On Ship Hospitals." "Naval Notes, Home and Foreign." "Mercantile and Various." "Notices of Books." Plate—The United States New Cruiser "New Orleans" (late "Amazanas," Brazil).

PORTUGAL.—*Revista Portugueza, Colonial e Maritima.* Lisbon: March, 1898.—"Vasco da Gama." "Colonial Agriculture" (*continued*). "Colonial Produce." "The Order of Christ" (*continued*). "The Tunny Fishery" (*continued*).

April, 1898.—"Vasco da Gama" (*concluded*). "Colonial Agriculture" (*continued*). "Expedition to the Gambos in 1856." "Inductive Telegraphy" (*continued*). "The Tunny Fishery" (*continued*).

SPAIN.—*Revista General de Marina.* Madrid: April, 1898.—"Injuries to Machinery at Sea, the Method of Repairing them" (*continued*). "New Formulas of Nautical Astronomy" (*continued*). "A Chapter of Naval Strategy" (*concluded*). "International Congress of Engineers and Naval Constructors." "Geographical-Medical-Social Study of the Island of Balabac." "The Fleets in 1897." "The Entrance and Instruction of Aspirants for the Marine Guards and Cadets." "A Short Glance at the Carolines." "The Ships of the Future." "The Trials of the 'Diadem.'" "The Japanese Navy." "Geometric Problems of Naval Strategy." "Note on the Determination of the Speed of Ships on the Measured Mile when there is an Appreciable Current."

MILITARY.

AUSTRIA-HUNGARY.—*Militär-Zeitung.* Vienna: 3rd April, 1898.—"Reform in Military Education." "The Influence of Ballooning on the Wars of the Future." 11th April.—"The Defects of the Pension Regulations." "The Spanish-American Conflict." "The Influence of Ballooning on the Wars of the Future" (*concluded*). 19th April.—"The Delegations and the Pay Question." "The Return of our Troops from Crete." "The same Rule for All." 27th April.—"King Albert of Saxony." "Military Pensions and Taxation." "The Spanish-American War."

Organ der Militär-Wissenschaftlichen Vereine. Vienna: April, 1898.—"The Offensive Operations of Archduke John in Italy in 1809." "The Appearances Presented by the Movement of Elongated Projectiles in Air-filled Spaces."

FRANCE.—*Revue du Cercle Militaire.* Paris: 2nd April, 1898.—"The March, the Halting Places, and the Fight in the case of Small Units" (*continued*).—"Two Months in Russia" (*continued*). 9th April.—"The March, the Halting Places, and the Fight in the case of Small Units" (*continued*). "Two Months in Russia"

(*continued*). 16th April.—"The March, the Halting Places, and the Fight in the case of Small Units" (*continued*). "The Army and Navy of the United States." "Two Months in Russia" (*concluded*). 23rd April.—"The March, the Halting Places, and the Fight in the case of Small Units" (*continued*). "The Moral Element in the Leading of Troops." "The First Standard for Reserve Officers in Italy." 30th April.—"The March, the Halting Places, and the Fight in the case of Small Units" (*continued*). "The Engagement of the 26th April at Vincennes."

Revue d'Artillerie. Paris: April, 1898.—"Experiments on the Traction of Copper and Brass.' "German Field Artillery Material, and Regulations for Evolutions and Firing." "Study on the Employment of Artillery Scouts." "An Essay on the Execution of Perspectiye Drawing."

Le Spectateur Militaire. Paris: April, 1898.—"Guerilla Warfare and the Commissariat Service" (*continued*). "The Order Book of an Infantry Regiment in 1781" (*concluded*). "Captain La Tour d'Auvergne, First Grenadier of the Republic" (*continued*).

Revue de Cavalerie. Paris: April, 1898.—"Some Reflections on the Employment of Cavalry in War." "Spain." "The Cavalry in the Battles of the Future—Studies in Applied Tactics." "Cavalry combined with Infantry" (*concluded*). "The Crossing of Rivers by Cavalry."

Journal des Sciences Militaires. Paris: April, 1898.—"Napoleonic Maxims." "Cavalry against Infantry." "The Ground, the Men, and the Weapons in War" (*continued*). "Preparation of the Company for Combat" (*continued*). "The Weapons of To-morrow."

Revue du Génie. Paris: April, 1898.—"The German Pioneers at Wörth." "Practical Instruction in the Properties of Iron and Steel for Building Purposes" (*continued*). "Vauban—Analysis and Extracts" (*continued*).

Revue Militaire de l'Étranger. Paris: April, 1898.—"The Turco-Greek War" (*concluded*). "The German Army—Organisation of the Artillery" (*concluded*). "The Re-organisation of the Italian Army" (*concluded*).

GERMANY.—*Militär-Wochenblatt.* Berlin: 2nd April, 1898.—"On Energy in Warfare." "The Sanitary Service on the Battle-field under Modern Fire." "On Skill in Judging Distance" (*concluded*). 3rd April (*extra number*).—"The Improvement in the Under-Officers' Position in Austria-Hungary." "Comparison of German and Russian Military Expenditure." 6th April.—"The Sanitary Service on the Battle-field under Modern Fire" (*concluded*). "The National War on the Loire." "Inoculation as a Remedy for Pneumonia in Horses." 9th April.—"On the Organisation of a Cavalry Division for Strategical Intelligence Duties." "Campaigning Letters of General Count Wartensleben-Carow." 13th April.—"General von Leszczynski." "Historical Instances from the Franco-German War of 1870–71." "National Studs for Military and Private Supply." 16th April.—"National Studs for Military and Private Supply" (*concluded*). "Spain and the United States." 20th April.—Riding in the German Army." "A New Field Glass." A New Relief Map." 23rd April.—"Birthday and Jubilee of the King of Saxony." "Riding in the German Army" (*concluded*). "Numbers in War." "Re-engaged Musicians." 24th April (*extra number*).—"War Dogs and Cyclists." 27th April.—"Psychology in War." "On the Education for an Officer in the United States Army." 30th April.—"The Battle of Kandern, 20th April, 1848." "Psychology in War" (*concluded*). "On the Education for an Officer in the United States Army" (*concluded*).

Jahrbücher für die Deutsche Armee und Marine. Berlin: April, 1898.—"The Fortification of a Permanent Entrenched Camp." "The Bombardment Controversy." "The Italian Army and Navy in the Second Half of 1897." "Hoenig's National War on the Loire." "The German Colony of Togoland." "On Provision for Retired Officers."

Neue Militärische Blätter. Berlin: April, 1898.—"Experiences and Correspondence with General Steinmetz." "Cavalry Corps and Divisions." "The English Army of To-day." "The Royal French Army of 1789" (*continued*).

Deutsche Heeres-Zeitung. Berlin: 2nd April, 1898.—"On the Value of Preserved Provisions in the Army." 6th April.—"The Defence of the Frontier." "An Appreciation of Frederick the Great as a Commander." 9th April.—"An Appreciation of Frederick the Great as a Commander" (*continued*). 13th April.—"An Appreciation of Frederick the Great as a Commander" (*continued*). 16th April.—"The Employment of Cavalry." "The Significance of Epinal." "An Appreciation of Frederick the Great as a Commander" (*continued*). 20th April.—"Spichern once more." "An Appreciation of Frederick the Great as a Commander" (*continued*). 23rd April.—"King Albert of Saxony." 27th April.—"The Sea-Power of Spain and the United States." "The Establishment of a Defence Fund." 30th April.—"The Establishment of a Defence Fund" (*continued*).

Internationale Revue über die Gesammten Armeen und Flotten. Dresden: April, 1898.—"King Albert of Saxony." "Wörth." "Field Artillery Quick-Firing in the Past." "The British Army and Navy." "Trains and Columns in the Russian Army." "Military Exposition in Brussels." "Competition in East Asia."

ITALY.—*Rivista di Artiglieria e Genio.* Rome: March, 1898.—"The Montenegro Region." "On the Application of the Principles of Defence." "A New Smokeless Powder 'Plastomenite,' of R. Wille." "New Instructions for Swiss Campaigning Artillery." "Photographs of the Bursting-point of Shells." "Traverse Bridges for Water Courses." "Quick-firing Gun Carriage with Tail Brake." "Sight Elevator for Field Guns." "The Armoured Cupola of Fort Waelhem." "New German Campaigning Material." "Microscope for Reading Micro-Photographic Plans." "Eden Portable Filter." "Military Notes, Home and Foreign." "Notices of Books, etc."

Rivista Militare Italiana. Rome: April 1st, 1898.—"Some Ideas on War in view of Universal Service." "The Cavalry of 1897." "The Disembarkation of a Force on a Hostile Coast" (*continued*). "Political-Military Notes." 16th April.—"Militarism." "On the Direction of the Study of Military Geography." "The Disembarkation of a Force on a Hostile Coast" (*continued*). "Political-Military Notes."

RUSSIA.—*Voïénnii Sbórnik.* St. Petersburg: January, 1898.—"Joan of Arc." (with plans). "The Moral Element in the Hands of Peter the Great." "War and National Economy." "A Collection of Military Regulations." "A Sketch of Cavalry Tactics after Foreign Regulations" (with plans). "On the Question of Outpost and Scouting Duty." "Remarks on Shooting by Squads." "On the Practice of Employing Officers for Clerical Work." "A Note on Pensions from the Retired Fund." "A Few Words on the Regulations as to Compulsory Service." "A Note on the Article 'The Assembling for Discussion of the Officers of a Regiment.'" "On the Way to Abyssinia" (Diary of the Head of the Escort).

February, 1898.—"The Grand Duke Michael Pavlovich (on the Centenary of his Birth, 1798-1898)." "Pfuhl's Plan: a Study from the History of the Invasion." "Will Armies Millions Strong take the Field in the Next Great European War?" "War and National Finance." "On the Question How to Train and Provide the *Personnel* of the Supply Department." "After Practice (with regard to Statistics of Firing Practice in the Artillery)." "The Command of Separate Brigades and Divisional Staffs." "The Programmes and Arrangements for Teaching in Cadet Schools." "On the Material and Official Position of the Superintendent of the Civil Branch in District Commands." "How to Colonise Siberia." "On the Way to Abyssinia" (Diary of the Chief of the Escort) (*continued*).

March, 1898.—"The Real Significance of Independent Action in Command in War-time." "The 3rd Battalion of the Bulgarian Levy in the Battle of Eski Zagra" (from the Diary of one who took part in it). "War and National Finance." "On Snap-shooting." "Manœuvres of all Arms." "An Inquiry into the Elements of Cavalry Action." "The Brigade Division of two Batteries." "On the Field Service Regulations." "On Promotion and Pensions." "On the Curtailing of Correspondence in the War Department." "A Few Words in Answer to Mikhuelvich." "On the Way to Abyssinia" (Diary of the Chief of the Escort) (*continued*).

SPAIN.—*Memorial de Ingenieros del Ejército.* Madrid: March, 1898.—Has not yet been received.

Revista Técnica de Infantería y Caballería. Madrid: 1st April, 1898.—"The War of the Low Countries." "Reminiscences of the Insurrection in the Philippines." "Parade Coat of Mail of Don John of Austria." "Foreign Military Notes." 15th April.—"The War of the Low Countries." "On the Cuban Problem." "Antecedents for the Military History of Cuba."

SWITZERLAND.—*Revue Militaire Suisse.* Lausanne: April, 1898.—"The German Imperial Manœuvres in 1897." "Remarks on the Grand Manœuvres." "The Manœuvres of the 2nd Corps in 1897." "On the Provisional Fortification of Improvised Fortresses."

NOTICES OF BOOKS.

Roddy Owen (Brevet Major, Lancashire Fusiliers, D.S.O.). A Memoir. London: John Murray, 1897.

There is scarcely an Englishman of the present day, and certainly no soldier, who needs to be reminded who "Roddy Owen" was; and yet poor Roddy has been dead nearly two years, and in these busy times the man whose memory can outlive that period may be considered to have fairly established a claim to distinction. It is worth considering why one whose career as a grown man extended over no more than twenty years, and who devoted sixteen years of the twenty to sport, should yet have achieved a popularity which has outlived that of the vast majority of the statesmen, authors, painters, or poets of his day. The answer to the riddle is to be found in the very readable and interesting Memoir now before us, which sets forth clearly enough the qualities and characteristics which caused Roddy Owen to be recognised without cavil as the best gentleman-rider of his day, and which enabled those who cared to look further to find in him "those sterling qualities, begotten of a loyal nature and of a noble mind, which make great and distinguished men." A great man, in the ordinary sense of the term, Roddy Owen never became. An unkind fate cut short his promising career before he had achieved greatness; but such distinction as is given in England by pre-eminence in sport was his, and the promise of the higher and purer distinction of great public services was unmistakably his also. In these facts lie the justification of the embalming in a Memoir of a humble "Captain and Brevet Major of the Lancashire Fusiliers."

It is hardly necessary to dilate here on the turf achievements of Roddy Owen. Such victories as his have a literature of their own, and a devoted public to read it. To these devotees his memory will long be dear. His "Memoir" is addressed rather to that smaller and more serious public whose interest is attracted by the services to his country which the dead soldier crowded into the last four years of his too short life. It was in 1892 that Roddy Owen crowned his racing career by winning the "Grand National," and in 1892 he had also his first experience of active service. Employment in the Mounted Infantry Regiment at Aldershot in the previous year had obtained credit for him for the

possession of military qualities, and the opportunity afforded him by his selection for service in the Jebu Expedition in West Africa was promptly seized. This small campaign in the Lagos Hinterland was a brief one indeed. Owen left London on March 29th, 1892, and landed at Dover on June 24th, less than three months later; but in that short period he had shown great promptitude and courage, had rendered signal service, and had seen once and for all that there was something in soldiering that sport alone could not offer. In December of the same year Owen "decided to take a dog to Uganda," or in other words, joined Sir Gerald Portal's mission to that region. He remained at Uganda about a year and a half, and, throughout that period, laboured with all his strength, all his tact, courage, and endurance to do what in him lay, to "realise Cecil Rhodes' dream." Whether or not that dream will ever be fulfilled lies on the knees of the gods; but if ever England owns a great dependency stretching from Alexandria to Cape Town, a niche in Westminster Abbey or St. Paul's Cathedral may be spared for the names of those who pioneered the noble enterprise, and among them will be found that of Roddy Owen. The rest of the story must be briefly told. Early in 1895 Owen joined his regiment in India, and speedily found his way, in the capacity of newspaper correspondent, to the main army which, under Sir Robert Low, was attempting the rescue of the beleaguered garrison of Fort Chitral. Owen was present at the capture of the Malakand Pass, and then, having accompanied the force to a point whence a dash might be made, rode with Captain Frank Younghusband, and without escort, "through beautiful smiling villages, and depressed, terror-stricken inhabitants" to Chitral, a distance of forty-four miles. From Chitral, Owen visited the Pamirs, and his experiences in that debatable land are full of interest and are well told in the Memoir. Soon afterwards he found his way once more to the Nile. Africa, like the East, can be heard a-calling, and those who hear the summons obey it. Those who have been interested by this brief summary of this Memoir should read for themselves the story of Roddy Owen's share in the Dongola Expedition of 1896. Few who follow it to the end will close the Memoir without a sigh, and none will quarrel with the concluding remarks of the biographers of a true English soldier and gentleman:—"He worked in his own manner, and with all his power; he sacrificed health and life in the service of his Queen and country; and when the true relation of current affairs to the great events of the Victorian era can be accurately estimated, it is possible that a line on the scroll of fame may be found for the bold rider who planted the British flag at Wadelai, and returned to die in the course of the completion of his work in the front of the advance to Dongola."

English and Russian Military Vocabulary. Compiled by Lieutenant A. MEARS, Indian Staff Corps. 12mo. London: 1898.

This little work seems to have been most carefully compiled and ought to prove of great value to military students of the Russian language. The type is good and clear, and the book should repay the author for the trouble he has bestowed on it.

The Law of War. By I. SHUCKBURGH RISLEY, M.A., B.C.L. 8vo. London: 1897.

Hakluyt Society.—A Journal of the First Voyage of Vasco da Gama, 1497-1499. 8vo. London: 1898.

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PROMOTION, 1897.

Thirty-one Passed, obtaining **Special Mentions** and **Certificates.**

Work for the Examination in May now going on.

MILITIA MILITARY COMPETITIVE, SEPTEMBER, 1897.

The following **Twenty-Nine** passed—

First Artillery	E. W. Browne	1,955
Second Infantry	W. G. Neilson	2,046
5th ,,	F. Hardy	1,971
17th ,,	G. F. Brooke	1,820
20th ,,	J. M. Haskard	1,819
27th ,,	W. O. Stuart	1,796
41st ,,	G. M. Herbert	1,729
42nd ,,	J. M. McLaren	1,728
43rd ,,	G. D. Baillie-Hamilton	1,722
44th ,,	T. J. Marrable	1,722
49th ,,	A. G. Lind	1,700
54th ,,	H. Armstrong	1,684
57th ,,	O. R. L. Hampden	1,678
58th ,,	H. V. Roe	1,669
62nd ,,	F. K. Pomeroy	1,659
66th ,,	A. L. Mackinnon	1,626
75th ,,	J. A. Doig	1,604
79th ,,	W. R. Cowie	1,593
80th ,,	F. A. C. Hamilton	1,590
85th ,,	G. T. D. Hickman	1,583
88th ,,	H. R. Sandilands	1,578
— ,,	*J. F. Scobell	1,560
— ,,	*J. O. Greenwood	1,513
West India	A. Cameron	1,508
,, ,,	A. C. Mackinnon	1,379
,, ,,	M. M. H. Nevile	1,285
,, ,,	C. S. Dixon	1,273
Second University	H. G. R. Burges-Short	1,677
10th ,,	H. E. M. Turner	1,268

*Subsequently admitted.

In MARCH, 1897, **Twenty-Three** passed.

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